Fisher Controls
A Division Of Emerson Process Management

Senior Design Proposal

Standardization of Workbenches for Assembly Associates
&
Visual Organizational System for Hydraulic Test Equipment

THE UNIVERSITY OF IOWA

EMERSON PROCESS MANAGEMENT

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January, 2002

Questions or comments regarding the technical content of this proposal should be addressed to:
B.R.E.C. Consulting. The University of Iowa’s Senior Design Team can be reached at::
http://arrow.win.ecn.uiowa.edu/56160/group3/index.htm
EXECUTIVE SUMMARY

Since their advent in 1880 when William Fisher invented the Type 1 constant pressure pump governor in Marshalltown, Iowa, Fisher Controls has been an industry leader in process control valves. The Emerson Process Management family of companies evolved in 1992 when Fisher Controls was purchased by Emerson. Fisher-Rosemount was already a recognized leader in process automation products and technology, but they now offer even broader capabilities to help customers control, connect, and manage their process and business as Emerson Process Management.

In January of 2002, Emerson Process Management and The University of Iowa agreed to work with one another with the intentions of providing a positive experience for all of those involved, specifically Fisher Controls and four students taking part in Operational Systems Design. B.R.E.C. Consulting was formed by Andy Budish, Joe Randall, Tim Evans, and Mike Cavanaugh when they decided to work and learn as a group with Fisher Controls. B.R.E.C. Consulting believes that this experience will benefit all parties involved, preparing the students for their careers in industrial engineering in addition to further developing Fisher Controls’ relationship with engineering students at The University of Iowa.

Over the next several months, February through May, B.R.E.C. Consulting will be working with Fisher Controls on two projects. The first project entails the standardization of workbenches for assembly associates while the second project deals with a visual organizational system for the company’s hydrostatic testing equipment. B.R.E.C Consulting will in a professional manner with Fisher Controls in completing these projects.

The first project focuses on designing standard workbenches for assembly associates in Fischer Controls’ Large Special assembly area. Fisher is trying to establish standardized workbenches for all assembly personnel with the intention of striving toward 5-S principles. This will require a new workbench design with standardized tools and equipment. Quality, cost, and the consent of the assemblers that have established seniority will be greatly considered when selection options.

Not all valves can be tested with standard equipment because Fisher hydrostatically tests many different sizes and shapes of control valves. Many of the flanges created are used at often while it may be years until others are used. In order to better organize how these flanges and equipment are stored, the team will develop a more visual system that will allow the assemblers to locate the specific equipment needed at ease. Many barcode-inventory systems will be researched with cost and ease of implementation being the primary objectives in selection.
1. DESCRIPTION OF COMPANY

Emerson Process Management is a leading global supplier of products, services, and solutions that measure, analyze, control, automate, and improve process-related operations. The company evolved from the business previously known as Fisher-Rosemount, which was already a recognized leader in process-automation products and technology. As Emerson Process Management, they now offer even broader capabilities to help customers control, connect, and manage their process and business.

A subdivision of Emerson Process Management is Fisher Controls. This division is the world's leading supplier of process control valves, FIELDVUE® digital valve controllers, and related instrumentation; pressure regulators for industrial, commercial, and residential applications, including LP gas and field automation systems. Product lines include Fisher, CON-TEK, Posi-Seal, Gulde, Baumann, and Francel.

2. DESCRIPTION OF PROJECT

Standardization Of Workbenches For Assembly Associates: The first project focuses on designing standard workbenches for assembly associates in Fischer Controls' Large Special assembly area. Currently, each associate has their own tools and way of organizing their workstation area. In order to strive toward 5-S principles, Fisher is trying to establish standardized workbenches for all assembly personnel. This would require a new workbench design with standardized tools and equipment. An estimate of costs of workbench design, equipment, and tools, will be presented in the team’s final report to Fisher Controls.

Visual Organizational System For Hydraulic Test Equipment: Another area of need for the Fisher Controls division of Emerson Process Management is to develop a visual organization system for the company's Hydrostatic testing equipment. Since Fisher hydrostatically tests many different sizes and shapes of control valves, not all valves can be tested with standard equipment. Through the years, many valves have required us to create special flanges or plugs that will allow us to hydro test the valve. Many of these flanges will not be used again for years, while some are more commonly used. In order to better organize how these flanges and equipment are stored, the team needs to develop a more visual system that will allow the assemblers to easy locate the testing equipment they need to complete the test. This would include an easy to use database, new storage system, and a way to clearly mark and identify all of the equipment.
3. PROPOSED APPROACH

B.R.E.C. Consulting will strive in providing Fisher Controls with well-researched options for a standardized workstation in the heavy assembly area as well as a visual storage system for the hydrostatic testing flanges.

**Standardized workstation**

B.R.E.C. will visit Fisher and conduct informal interviews with the heavy assembly workers in the working environment with the intention of building a positive relationship. The workers that have established seniority will be asked to compile a list, to the best of their knowledge, of all the tools that they use. This list would include all tools, whether they are used on a daily basis or less than once a year. These lists will then be compiled into one list and distributed to the same workers to double-check the information they have provided. The rest of the heavy assembly workers will then be asked to add any tools they feel are missing, creating a “master list”. This list will then be distributed to all heavy assembly workers and they will be asked to assign a rank to each tool based on how often that particular tool is used.

The results will be collected and analyzed and a standard tool set will be created. This may include several sets, e.g. a set of commonly used tools at every workstation and one set of rarely used tools located in a central cabinet. Fischer will be provided with two or three proposed standardized tool sets. Once one has been chosen, the workstation will be designed around that set.

**Visual Organization System**

B.R.E.C. will visit Fisher and inventory the hydrostatic testing flanges. An area will be made available by Fisher to be used for storage of the flanges. Many visual organization systems will be researched and two to three quality recommendations will be presented to Fisher. Criteria used to determine the optimal system will be cost and ease of implementation.
## 4. PROPOSED DELIVERABLES

<table>
<thead>
<tr>
<th>Study</th>
<th>Item</th>
<th>Description</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>D1</td>
<td>Recommended standardized tool set as well as one to two other standardized tool sets</td>
<td>March 15, 2002</td>
</tr>
<tr>
<td>2</td>
<td>D2</td>
<td>Standardized work bench, that is integrated with the previously selected standardized tool set</td>
<td>April 30, 2002</td>
</tr>
<tr>
<td>3</td>
<td>D3</td>
<td>Recommendation for organization and implementation of optimum storage system for hydrostatic testing valves</td>
<td>April 30, 2002</td>
</tr>
<tr>
<td>1,2,3</td>
<td>D4</td>
<td>Progress Report and Midterm Presentation</td>
<td>March 12, 2002</td>
</tr>
</tbody>
</table>
# 5. PROJECT SCHEDULE & TIMELINE

<table>
<thead>
<tr>
<th>Level and Nature of Involvement</th>
<th>Study Number</th>
<th>Study Description</th>
<th>Proposal Task</th>
<th>Tasks and Individual Steps to be Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>None given</td>
<td>None Given</td>
<td>A</td>
<td>Make contact with Emerson to receive project parameters. Establish project web page.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>Literature review of 5-s Principles. Inquire with Emerson engineers the reason for standardizing and benefits to assembly workers. Share information with assembly workers in order to create rapport to lessen resistance to standardization.</td>
<td></td>
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<tr>
<td></td>
<td>1</td>
<td>C</td>
<td>Interview workers with the most seniority. Have workers create a list of tools in their personal tool sets. Compile results and check compiled list with said workers.</td>
<td></td>
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<tr>
<td></td>
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<td>D</td>
<td>Distribute previously compiled list to all assembly workers. Add any new additions to tool list. Create survey that allows workers to rate each tool on how often it is used. Research tool prices, quality, and availability. Create multiple ideas for standardized tool set. Determine optimal tool set and make recommendations. Submit recommendation to Emerson.</td>
<td></td>
</tr>
<tr>
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<td>E</td>
<td>Review of the literature on workstation design. Find examples of newly developed workstations. Research prices, materials, availability, durability, etc.</td>
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</tr>
<tr>
<td></td>
<td>2</td>
<td>F</td>
<td>Using examples, create optimum workstation to fit with standardized tool sets. Integrate recommendations into Final Report.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>G</td>
<td>Request building layout from Emerson. Inquire what areas will be allocated for valve storage. Inquire about availability of bar code scanners. Inquire about possibilities of HTML utilized system.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>H</td>
<td>Literature review of available storage system options. Speak with experts about industrial barcoding and other available options.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>I</td>
<td>Combine cost analysis, research, and outside expertise to give recommendations for optimal storage. Integrate recommendations into Final Report.</td>
<td></td>
</tr>
</tbody>
</table>
6. GANT CHART TIMELINE

Please see project website at the following URL to view various views of B.R.E.C.'s Gant chart timeline as well as updates on our completion schedule throughout out the semester.

http://arrow.win.ecn.uiowa.edu/56160/group3/index.htm

7. CONTACT INFORMATION

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