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PRESENTED BY: BILL NEEVE
CYCLE TIME MANAGEMENT INC.

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CYCLE TIME MANAGEMENT INC. BUSINESS ASSESSMENT

Almag Aluminum

EXECUTIVE SUMMARY

Almag Aluminum Inc. (Almag) initially contracted with Cycle Time Management Inc. (CTM) to perform a detailed Business Assessment of their manufacturing operations. As a result of this assessment Almag initially requested Cycle Time Management's assistance in upgrading to the new ISO 9001:2000 quality system standard and subsequently the development of educational and facilitation requirements to support Almag's implementation of lean manufacturing.

Almag determined that the ISO 9001:2000 upgrade was the first priority. Upon successful certification in December 2003 it was to be followed by the Lean Manufacturing 12 Step Program. The 12 Step Program was intentionally phased in slowly due to other short-term priorities and concerns over work overloading, commencing with awareness training, strategic development, business simulation, value stream mapping etc. in the 4th quarter of 2003 and culminating with the approval of 29 projects at Step 6 by the Approval Team in April 2004. (In addition, over 30 other projects were inventoried for later implementation).

COMPANY BACKGROUND

Almag Aluminum Inc. is a family owned business that commenced manufacturing in 1953 and has grown to a full service provider of extruded products including a variety of extrusion presses and customized tooling, complimented by secondary operations such as but not limited to cutting, drilling, deburring, milling, punching, tapping, countersinking, polishing, bending, tumbling, finishing and assembly. Specialized services such as anodizing, painting and some finishing operations are outsourced.

Almag processes all sizes of orders (no order is too small if priced properly) thereby attempting to distance itself from its competition by providing excellent quality, flexibility and rapid turnaround. Tooling changeover time has been optimized accordingly. Almag's mission statement includes the phrase "service obsessed supplier" which summarizes how they wish to be viewed by the marketplace.

Almag occupies 108,000 square feet at 22 Finley that is dedicated to the extrusion process, packing and shipping operations as well as office space. A further 39,000 square feet at 12 Finley is used for fabrication and warehousing. Almag consists of 135 personnel on a three shift operation.

Almag initially gained ISO 9002 certification in 1997 but it was apparent that certification was mainly for marketing purposed and the company was getting little value from it.

Almag's sales growth had been relatively steady over the years with the exception of a spike in growth of 35 % in 2000 followed by a 15% drop in 2001. The new goal was to double sales over the next 3-5 years at a controlled pace with U.S. market penetration within a 500 mile radius seen as a key factor. Major markets served include appliance, aftermarket automotive, display industry, lighting and office furniture. Almag's niche includes tight tolerances, special finishes, thin walls, and complex shapes. In general customers regard Almag as a premium priced extruder offering excellent quality and delivery with a willingness to tackle the tough jobs.

With the Assistance of CTM personnel, Almag created and formalized the following Core Values for their personnel:

ALMAG CORE VALUES

Respect and Fairness

Treat others as we would like them to treat us.

Humility

Humble, recognizing that we are not perfect and that no matter how good we may be at something, we can be better. Open to constructive criticism.

Passion for Progress

A strong drive, or burning desire, to be better tomorrow than we are today. Anxious to make the effort to become better and to not be afraid of change.

Ownership

Treat the business as if it was your own. Have strong pride in the appearance and operation of the organization.

PHASE I - THE BUSINESS ASSESSMENT

The Objectives of the Business Assessment

- Implement a sustainable system to improve quality aspects and operations profitability
- Show the value of and obtain buy-in for, a process-flow understanding of each employee's tasks
- Help define measures of process flow to see clearly where each process is, and where it is trending
- Demonstrate to employees and managers that this is a world-class approach that will empower each person to positively control and improve the tasks they do, within the flow of the company's processes

What does the Business Assessment provide?

- Determine the potential for improvement in business process cycle time
- Review all aspects of the business to achieve productivity advantages
- Highlight and increase awareness of problems in areas such as quality, process and product reliability, new product introduction cycles and manufacturing cycle time
- Evaluate the capability for a continuous improvement and participative team approach philosophy throughout the whole corporate business unit

CTM ‘s Business Assessment had three components:

- Operations Cultural Analysis (refer to page 7)
- Core Process Cost / Time Analysis (refer to page 8)
- ISO 9001:2000 Gap Analysis (refer to page 9)

CTM ‘s goal was to assist Almag to integrate a new process driven Quality Management System with a more efficient total Business Management System that will facilitate focus of all Almag employees on:

- Waste elimination
- Simplification of process-flow
- Integration of effort
- Efficiency of operations
- Improved profitability
- Enhanced quality
- Cycle time reduction
- Developing and maintaining a Continuous Improvement methodology
- Understanding and implementing lean manufacturing concepts

Business Assessment - Procedures

CTM's business assessment process basically consisted of the following key steps:

1. Conducting extensive interviews with key management and employees to determine the "current state / as is" position" with respect to:
    - operating practices and performance levels
    - present and future projects
    - issues and concerns
2. Determining management's strategy, goals, objectives and tactics for operating the business.
3. Conducting a "gap analysis" between the current ISO 9002 (1994 standard) and the new process driven ISO9001:2000 Quality Management System via extensive interviews and audits.
4. Providing a specific cost / time analysis for a key core process.
5. Building a rapport with a broad section of the employee team.
6. Determining whether people really understand what is required and expected of them during the evolution toward lean manufacturing.
7. Gathering relevant information that will help to customize education recommendations.
8. Obtaining feedback on how Almag is perceived from an outside source, including providing an impartial look at how Almag is operating against benchmarks for similar industries.
9. Gathering constructive information (very open and honest) for Almag's management team on how the company is perceived by all levels in the company.

Operations Cultural Analysis

The first component of the business assessment was to determine Almag's existing operational culture and readiness for significant change. A problem positional analysis was generated to define the type of problems affecting lean manufacturing implementation and to clearly define the present situation.

The top 10 problem areas identified were

1. Lack of Lean Manufacturing Knowledge
2. Training Effectiveness
3. Production Efficiency
4. Communication Effectiveness
5. Corrective Action Effectiveness
6. Lack of a Continuous Improvement Culture
7. Scheduling
8. Overall Employee Skill Level
9. Teamwork between Departments
10. Moral

Specifics on the #1 issue "Lack of Lean Manufacturing Knowledge" are detailed as follows:

- Have implemented some components of lean manufacturing; such as Kaizan blitzes (focusing on plant layouts) and JIT inventory management with varying degrees of success
- Continuous Improvement mindset is only in early stages and needs emphasis on sustainability through periodic verification
- Production is based upon demand with the exception of a few customers that are based upon a rolling forecast

- Total Productive Maintenance system is in place but is not very effective
- Setup improvement opportunities are not consistently acted upon
- Kaizan not utilized in fabrication and could be beneficial
- Awareness of internal and external customers needs improvement
- EPICS (Extrusion Process Information Control System) has capabilities that are not understood or implemented across the company
- Lack of exposure to and implementation of full lean manufacturing “tool kit”
- Improved profitability

Opportunities to Realize

- Substantial positive impact possible on reducing costs and improving throughput by adopting additional lean techniques
- Process changes can be better planned to eliminate quality / delivery problems
- Utilize Continuous Improvement vehicle and EPICS system to distance Almag from its competitors
- Communication within the facilities should be more visual, with respect to positive results
- Create realistic production baselines and entitlements to improve performance.
- Scheduling enhancements to reduce non value added activities

Lean Threats to Overcome

- Lean manufacturing if improperly implemented will be viewed as another flavor of the month program
- 40% of shop floor is against change and is fearful of layoffs
- Lean manufacturing could be perceived as a cost reduction plan resulting in further layoffs
- Some complacency on current practices as a result of general ignorance of what can be achieved
- Approximately 25% of company have blinders on with respect to caring about the company's success and don't realize how they can make a difference
- Some resistance to implementation of new systems and associated accountability

Core Process Cost /Time Analysis

When compared to peer groups, Almag was outperforming the median group with respect to operating profit as a percentage of sales. However Almag is trending downward with respect to current ratio (current assets / current liabilities). Inventory levels (in particular raw materials) were deemed to be approximately double what they should be.

Almag had a serious problem with extruder downtime which was resulting in a loss of sales of approximately $1000 per hour. As a result, the CTM personnel analyzed preventive maintenance support when attempting to maximize the overall extrusion core process. It was determined that Almag was in a firefighting mode and had a very rudimentary preventive maintenance program. Considerable data was being collected but not analyzed or more importantly being acted upon. CTM created a Pareto diagram of root causes and identified approximately $400K in potential savings from the top 3 causes alone (table full, billet oven and die problems). Shortly thereafter Almag terminated their Maintenance Manager and in the fall of 2002 hired Ainsworth Electric for a five year period to provide maintenance direction. As a result of this activity, CTM’s future focus during the 12 step lean manufacturing program excluded preventive maintenance.

ISO 9001:2000 Gap Analysis

Almag was first certified to ISO 9002 in 1997 and despite 5 years of ongoing internal and surveillance ISO audits, quality emphasis was restricted to product quality versus the overall quality system and ISO was not being fully utilized as a management tool.

It was readily apparent to an informed outsider (CTM) that the ISO quality system was very ambiguous and not user friendly. Although some of the factory work instructions were very detailed, the overall documentation did not include the appropriate bridges between the Quality Policy Statement, quality objectives, key metrics, quality policy manual, procedures and work instructions. The overall documentation varied between overkill, redundancy, confusion and serious information gaps.

The old quality system as created mainly by the quality department was somewhat in isolation from the rest of the company. Other Almag employees lacked understanding of ISO and appreciation how it could improve their jobs. It was obvious that Almag viewed ISO as a necessary marketing tool only, which history dictates is clearly the wrong reason for implementing ISO. Although Almag's old quality system met the basic intent of the 1994 standard, it was clearly not adding value. With the emphasis of the new standard on process analysis and continuous improvement, the gap analysis revealed serious shortcomings in the following areas:

- Customer focus / handling of customer complaints
- Lack of bridges between the quality policy statement, quality manual, procedures, work instructions, objectives and key metrics
- Inadequate training processes
- Superficial management review process
- Lack of a continuous improvement culture
- Untimely review of key metrics and subsequent corrective action
- Weakness in approval of new suppliers, supplier performance rating and control of the Approved Suppliers List
- Marginal internal audit process
- Effectiveness of corrective actions

To Almag's credi,t the shop floor operations including production, material identification and traceability, inspection, calibration and rudimentary preventive maintenance instructions were basically in compliance. The greatest shortcoming was obviously with respect to office / management controls.

Business Assessment Conclusion / Recommendations

After reviewing the information gathered from performing the business assessment analysis CTM reached the following conclusions on Almag's potential and state of readiness to undertake both a Lean Manufacturing implementation and upgrade to the ISO9001:2000 Quality Management System.

Almag's President, Bob Peacock and Plant Manager / Quality Manager Connie Power confirmed that the ISO 9002 system had untapped potential. They were encouraged with the introduction of the new ISO 9001 system with its dedicated process approach, continuous improvement culture, clear emphasis on establishing meaningful performance metrics, timely corrective actions, a serious commitment to improving training, ensuring "added value" during management review activities, streamlining documentation etc. Bob and Connie also viewed the introduction of a revamped ISO9001: 2000 system as an opportunity to provide a consistent business vehicle for the management team. Accordingly it was determined by Almag to proceed with the ISO 9001:2000 registration prior to any other lean manufacturing initiatives.

It was determined that Almag had to develop a 12 Step Evolution Plan. This plan, with supporting strategies, had to be clearly communicated and understood by everyone in the organization. Almag had clear areas of opportunity for improvement using lean manufacturing initiatives as a part of their plans for continuous improvement and making Almag a world class extruder (primarily in lead time reduction and internal quality improvements):

Almag had sufficient strengths to move toward a Lean Manufacturing 12 Step Implementation. The President had a clear vision of what that was: “maximize return on invested capital by improving throughput and eliminating waste and non-value-added activities”. The adoption of more appropriate scheduling, production and managerial philosophies were vital to allow for that success. Teamwork, education and more effective processes were all capable of being installed at Almag. Almag had to encourage and nurture a "Team Approach" culture to problem solving and for planning the implementation of change across the organization.

Almag needed to develop a Lean Manufacturing evolution plan that focuses on all projects and integrates all activities for improvements and clearly communicate it to the whole organization. The evolution plan would be an integral part of building commitment. The Lean Manufacturing implementation would not succeed without a total commitment toward a common goal at all levels in the organization. The commitment was there for the President and management team with the exception of a strong-willed Operations Manager who felt threatened by the self-discovery concept and to a lesser extent the Controller. This resulted in a one year delay in starting the program. Ultimately Almag decided to follow CTM’s proven 12 Step self-discovery team focused process approach integrated with timely education and facilitation to substantially improve to improve productivity, quality, cycle time and overall operations throughout the organization.

Phase II – ISO 9001:2000 Implementation

The ISO documentation had to be created from scratch with the exception of the detailed factory work instructions, which had to be fine-tuned and streamlined. The review and rewriting of new documentation was done in the first quarter of 2003 and then slowly implemented due to the need to complete the existing 9002 audit program with the current registrar.

By the time that certification was achieved in December 2003 Almag was fully utilizing ISO 9001:2000 as their vehicle for managing and improving their business. The registrar was very complimentary of Almag’s ISO 9001: 2000 Quality Management System and was particularly impressed that Almag had established a meaningful continuous improvement system with cross-functional involvement. This continuous improvement system served as an introduction to the planned 12 Step program that was initiated in late 2003.

Phase III – Lean Manufacturing / 12 Step Program Implementation

The Business Assessment laid the foundation for Almag to work closely with CTM to set a plan in place for the successful implementation of a series of continuous improvement projects. Initially Almag decided to put the plan on hold due to the fact that the President was basically taking a year’s sabbatical because he was heading up the Toronto Board of Trade. He promoted the Sales Manager to Operations Manager to mind the company in his absence. As stated earlier the Operations Manager was one of two members of the management team who felt that Almag should be able to improve the company themselves without the assistance of outside trainers. The President gave him a year to show some progress and at the end of that time (September 2003) was disappointed in the results and engaged the services of CTM. The Operations Manager threatened to quit because he still felt that trainers were not the answer. He continued employment with Almag and despite agreeing to be at least neutral, he continued to be a negative distraction during the self-discovery process.

CTM assisted in the hiring of an Almag Continuous Improvement Coordinator and subsequent training of that individual in October 2003. Due to a pending ISO 9001:2000 certification audit in December 2003 Almag requested a very gradual startup of lean manufacturing activities. During the startup phase Almag mandated that membership on the Planning

Forum for would be done on a voluntary basis (contrary to CTM's recommendations). This resulted in a few potential key leaders / members declining involvement due to subtle pressure from the key dissident, the Operations Manager. Logistically setting up the initial training sessions and team meetings was awkward due to personnel working on all three shifts and determining optimum meeting times for a quorum of members. However the scheduling issues were resolved. In October a Strategic Workshop was held with the combined planning forum and approval team. This was followed in November with Lean Manufacturing Overview training complemented by the "Business Simulation Game". In early December a training seminar on Value Stream Mapping was conducted and this resulted in the combined Approval Team / Planning Forum creating a draft Almag value stream map. As a result of this activity the Planning Forum was anxious to begin the journey but unfortunately the Christmas break caused a 3 week interruption.

Upon return from the break, in accordance with the needs demonstrated by the value stream map, the Planning Forum created 8 Project Review teams as follows:

- Packing / Shipping,
- Subcontractor Development
- Fabrication
- Quality
- Material Management
- Extrusion
- Die Management
- Scheduling

Team members were nominated and then were given the option of joining. Within 2 weeks a core group of 31 review team members were distributed across the 8 teams. All teams were represented by subject experts as well as other cross-functional contributors. Over the ensuing 10 weeks the teams mapped out 61 projects which were prioritized for 33 to be presented for management approval at Step 6 on March 26 with the other 28 to be inventoried for approximately 3-6 months due to limited Almag implementation resources.

Savings Summary

During Phase I the annualized cost savings were identified by CTM. During phase III the annualized cost, space and cycle time savings were identified by the project teams during a self-discovery process under the guidance of CTM trainers. All figures are conservatively stated and are deemed to be totally realistic.

In summary Almag is expected to receive annual savings of over $1Million from the opportunities identified during both CTM's initial business assessment and the self-discovery process for Almag employees (as directed by CTM's 12 step process) versus an outlay of $110 K in client fees.

Space Savings

The project teams identified space savings of 16,500 square feet (a reduction of over 11%)

Cycle Time Reduction

The project teams identified a conservative reduction of cycle time of 40%. Reduction in cycle time (throughput) was particularly important in order for Almag to satisfy its motto to be "service obsessed" and to continue to distance versus itself from its competition.

Phase I - ISO Plus Business Assessment

"The CTM Business Assessment re-affirmed my feelings that change had to happen. It provided a comfort zone from an outside observer that we had to change the way we operated if we wanted Almag to improve."

Bob Peacock (President)

Phase II - ISO 9001:2000 Implementation

"Our registrar was extremely complimentary on how well the quality management System documentation was written and understandable for users. We are now fully taking advantage of management review meetings to review both business operational issues in conjunction with corrective actions and an ongoing continuous improvement methodology."

Connie Power (Plant Manager)

Phase III – 12 Step Program

"Continuous Improvement is necessary for Almag to stay in business. CTM's 12 Step Program is about building a new culture throughout the company. The 12Step Program created an internal mechanism that got people together, allowed the group to start thinking, to throw out ideas. It started our journey of continuous improvement. The 12 Step Methodology has stimulated idea generation throughout the company and is as important as anything that Almag Aluminum has ever done.

The work done by the Project Review Teams over the last 5 months is a great start. Many ideas have been generated. Our job is to hear your ideas, provide information that will help you identify if the ideas are worth implementing and then to supply whatever help you need to get your ideas implemented.

Ownership of change is the most important factor in determining the success of those changes. Having a group of people who believe in the changes that should be made to improve Almag and who are passionate about making those changes, is very powerful."

Bob Peacock (President)