

ULTRAMAX® -- Increasing Profits Margins in Production / Manufacturing

Advanced Process Management™ (APM™)

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Technical Summary.doc 6/17/06

If you want to generate more value (as you define it) with your current equipment, consider a superior tool for Managing its production / manufacturing Operations

“OPTIMIZATION is a matter of ATTITUDE and TECHNOLOGY” C.W. Moreno, Industrial Engineer

This is a concentrated technical summary. There are simpler introductions in www.ultramax.com.

Production / Manufacturing Operations

The basic situation and opportunities in industry are:

- Operations of each production process are controlled by its Process Control System (PCS), including those with Advanced Process Control (APC). A PCS incorporates regulatory process control (that maintains controlled variables close to setpoints, the desired values), and frequently control logic (that automatically adjusts setpoints depending on conditions, and which may include some aspects of optimization).
- Plant personnel manage production/manufacturing with existing processes -- to get more of what they want with more certainty -- by tuning up the **adjustments** of: setpoints (those not adjusted by control logic) and biases (to refine the adjustments made by the control logic). These adjustment **decisions** are often made in response to changes in conditions or requirements, or to learn how to do better. The **objectives** usually include improving measured Key Performance Indicators (**KPI**, e.g. quality, throughput, costs, safety, contamination).

Optimal Performance Operations is to run production with the **optimal adjustment** decisions, which yield the **best possible outcomes**. The balance between multiple objectives is resolved by **metrics** to represent: (a) overall performance in direct economic impact, simpler quasi-economic approximations, or other measures; and (b) constraints for safety, reliability and requirements -- all of which may depend on conditions.

Optimal Performance Operations has the immediate benefit of making the achievement of plant commitments easier (even as important uncontrolled conditions change and when pushing the envelope), and long term by enabling the company to derive longer lasting profits from this production. Also, it sharpens the awareness of barriers and solutions. Optimization can be achieved with a particular mind-set at the plant floor, maintained by upper management, and supported by optimization technology.

Optimal Performance Operations Solution

ULTRAMAX® includes multi-input and multi-output

software that learns how to manage quantitatively the set of all **adjustments** collectively to optimize production operations performance according to the objectives and metrics you, the customer, define. It may include maintaining downstream variables close to desired values for those variables beyond the reach of single loop or multi-variable regulatory control.

ULTRAMAX hovers above the Process Control System under user control, sensing and guiding production operations within prescribed limits – enabling unexpected performance gains.

It works best for repetitive normal operations, usually excluding startups, maintenance, cleaning, etc. For just optimization studies it is significantly more effective than using Design of Experiments (DOE).

As compared to solutions emphasizing improvements in equipment and control systems, ULTRAMAX is management-centered, an Industrial Engineering tool. It automates aspects of supervisory control. It continually optimizes production operations as it compensates for measured uncontrolled conditions and according to current business needs and priorities. It is a complement, not a substitute, to personnel.

Gains generated in a great variety of high-volume industries usually range from a few \$100K to a few \$1M annually per process – and these are in tangible gains alone. Processes with smaller unrealized gains can take advantage of our 100% ROI guarantee or our Gain Sharing program. We also offer for each process which satisfies the four critical success factors and which does not generate tangible gains in six months, that the license and service fees paid will be returned.

Distinctions

Operational Performance is measured by metrics that you define based on data that you provide. As necessary, ULTRAMAX offers excellent options for you to create common-sense, holistic metrics so that calculated improvements are true bottom-line, avoiding hidden costs. As minor examples, it can easily include the (increasing) unit costs of energy, and metrics related to quality and consistency.

ULTRAMAX uses Sequential Empirical Optimization (SEO) technology. The production SEO cycles of ***Adjust, Run & Get data, Learn, Advise*** makes fine

re-adjustments every 10 min to two hours in continuous processes -- or every batch cycle time. It performs self-learning optimization. Starting from current adjustments, SEO cycles extrapolate quickly and safely towards an optimum. SEO optimizes faster than other technologies because:

- (A) It learns immediately from the information in the collected operating data – rather than waiting for the collection of a lot of data to be processed later.
- (B) It can be started right away -- rather than waiting until the creation of theoretical or empirical models, which is aggravated by their high costs in manpower and in making experimental and validation runs with very poor performance.

SEO is data driven and useful when performance can be measured readily. All processes with which one can exchange data – even if manually -- can be optimized as completely as the regularity of the data.

“If it can be measured, it can be optimized.”™

With ULTRAMAX you will be able to get profitability gains that are being wasted otherwise, plus other benefits as described in www.ultramax.com.

On-line applications have **integration** with the PCS for automatic data exchange (OPC uni- or bi-directional) to reduce work and human errors. The plant can select either only Advisory optimization (where operators need to approve the re-adjustments), or also enable Closed-Loop optimization for further reduced drudgery. Closed-Loop is turned on by plant personnel after they determine reliability. Closed-Loop reverts to Advisory if it detects abnormal or undesirable data, thus informing operators right away for awareness, and perhaps prevention for future increased reliability.

A unique feature is that adopting ULTRAMAX optimization to manage production operations does not require changes to the process hardware or its controls; it is a “**soft**” solution. Even integration is barely an intrusion on your equipment, and you remain in full control. Using ULTRAMAX will not delay any improvement projects on your production assets, as (the new version) is extremely simple to re-start.

There is an up-front Capability Test to detect discrepancies between the process, past usage and requirements before starting optimization; which may indicate advantages of making changes. Historically one-third of the processes needed some significant fixing – very useful information even if not optimizing.

If optimal operations are not satisfactory for the business, then the process (equipment and/or control system) needs to be improved. That is, the non-intrusive ULTRAMAX hovering above the process control system enables you to determine the situation, but it will not solve the barriers in the process.

Unique Features of ULTRAMAX

A summary of its most distinguishing differences vs. alternate solutions (from Automation, Control, and/or other Optimization suppliers) is:

1. It is Non-Intrusive – it does not require changes to the process equipment or control system.
2. It optimizes while engaging in regular production (it does not require performing non-productive, risky or expensive “experimental runs”).
3. Since the start of an optimization study or a dedicated implementation for on-going production with optimization, it is both the fastest optimizer and also the one that maximizes cumulative performance.
4. Because it is non-intrusive, universal and full-featured, the software does not require customization, and the license plus service fees are most competitive.
5. For the same reasons it is a tool-set for customers to use, maintain and adapt. Reconfigurations as changes occur in business needs or the process itself are usually done by the user without having to depend on your ULTRAMAX supplier – and it is much simpler since the new version. However, as requested, we offer training, and on-site and remote support.
6. It is the simplest optimization technology to implement and maintain – e.g., its suppliers only need to have general knowledge about production operations, not especial process expertise.
7. It has options for three optimization modes: stand-alone, advisory (one and bi-directional integration) and closed-loop; and users can readily change from one mode to the other – users are always in full control. It can even be turned off so users can continue with manual supervisory control but now with the enhanced knowledge.

Process Improvements and Optimization

At any time you may decide to fix problems or upgrade the process. If you require outside experts for these process changes you will need a different kind of supplier, such as of equipment, engineering, instrumentation, automation, controls or other optimization companies.

After any changes – even adding new products -- the same ULTRAMAX software you have is fully applicable to optimize the new operations (even if the changes include optimization in any subsystem or whole system). ULTRAMAX is likely to still deliver more value because of its other unique features to define and approach holistic, dynamic optimality – or it could prove that operations are optimal as far as the data can tell.

We propose ULTRAMAX as your company’s standard method to optimize and/or manage production operations, at least for the bottleneck processes in KPI achievement.

Ultramax Corporation and its Agencies welcome the opportunity to exchange insights and to clarify any issues. ULTRAMAX is part of best business practices.

For applications, details and contacts please visit

www.ultramax.com