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Sasol-Huntsman Plans Expansion in Germany

Sasol-Huntsman, a 50/50 joint venture between Huntsman and Sasol, located in Moers, Germany, has announced plans to expand its maleic anhydride manufacturing capacity from 60 mt to 105 mt by the first quarter of 2011. The 75% expansion will stem from the construction of a second world scale 45 kt reactor and purification section of the existing Moers plant. The new plant will operate independently from the existing plant to ensure uninterrupted product flow even during scheduled shutdowns and catalyst re-packs.

▶ www.sasol-huntsman.com

Evonik and Sibur Start Feasibility Study

Evonik and Russian JSC Sibur, based in Moscow, have agreed to start an exclusive feasibility study regarding the possible construction of a facility to produce propylene oxide, together with hydrogen peroxide, for use in the Russian Federation. The study is to be completed in the coming months and will determine possible locations and capacities. Sibur is considering the construction of a propylene oxide plant that uses the HPPO process, which produces propylene oxide from hydrogen peroxide (H_2O_2) and propylene in a low-cost and ecologically sound manner. Evonik and the engineering company Uhde, Dortmund, Germany, jointly developed this HPPO process and are now licensing it to other chemical companies.

▶ www.sibur.ru
▶ www.evonik.com

Carbogen Amcis Expands High Potency Offering

Switzerland-based Carbogen Amcis said its Indian Subsidiary, Carbogen Amcis India, plans to open a high potency facility in Bavla, India. The facility will be located on the Bavla site of its parent company, Dishman Pharmaceuticals & Chemicals. The facility is being designed and will be operated by the Carbogen Amcisteam to take advatage of the expertise and experience gained from high potency operations that already exist at tht dedicated Swiss high potency facilities. The building's framework has already been erected, and fit-out of the facility is already underway. The facility is expected to be operational by Q1 2009.

▶ www.carbogen.com

Dow Biocides to Increase Glutaraldehyde Capacity

Dow Biocides, a business unit of Dow, has announced it will increase its U.S. production capacity for glutaraldehyde by approximately 60%. The capacity is expected to be online and operational by January 2009. Glutaraldehyde from Dow is produced at Institute, W. Va, U.S., a site managed by Union Carbide, a wholly owned Dow Subsidiary.

▶ www.dow.com/biocides

Kureha Breaks Ground for New Polymer Plant

State and local dignitaries joined Kureha PGA as the company broke ground for its new, high-performance polymer, polyglycolic acid (PGA), plant. This new polymer will be sold and distributed under the Kuredux(TM) trade name. The facility, located at DuPont's site in Belle, W. Va. (U.S.), is expected to begin polymer production in early 2010. The first phase of construction will create approximately 50 new jobs and generate more than $100 million in economic impact.

▶ www.kureha.com

Borouge Expands Operations

Borouge announced that it has initiated the feasibility study for Borouge 3: A further expansion of its polyolefin operations in Abu Dhabi to add approximately 2.5 m t/y of capacity by end of 2014. The proposed expansion would enable Borouge, a joint venture between the Abu Dhabi National Oil Company (ADNOC) and Borealis, to meet the growing demands of specific polyethylene and polypropylene markets in the Middle East and Asia. The Borouge 3 study will explore options to take advantage of additional feedstock becoming available from planned upstream ADNOC expansions to expand both Polyethylene and Polypropylene production capacities beyond the current Borouge 2 Project which is under construction and on target for start up in 2010. The proposed expansion will boost Borouge's total production capacity to 4.5 m t/y. It will be located alongside the existing Borouge 1 and Borouge 2 petrochemical complex at Ruwais, Abu Dhabi, in the United Arab Emirates.

▶ www.borouge.com

Conceptual Design

Sustainable Successful Maintenance

Making Maintenance Work – With the pursuit of sustainment and improvement of the competitiveness in national and international markets, companies increase their equipment intensity, level of automation and the linking of the machinery.

Prof. Dr. Dimitrios Kalaitzis

Dr. Walter Hahn

High maintenance costs and – resulting from unscheduled machine downtime – high plant loss costs are the consequences that substantially affect the economic situation in many enterprises. According to present estimations, maintenance cost amount to about €250 billion per year alone in Germany.

Due to this situation, enterprises and corporate groups have accomplished numerous maintenance projects in the last years and tapped the full potential of obvious fallow improvement areas, also called "low-hanging fruits." Often, the result of these projects was staff reduction in the maintenance department that led to substantial loss of know-how in important technical disciplines.

Accompanying with this development, the reluctance of the employees rose against new improvement projects in the maintenance. Further improvements in this area can be hardly realized by top-down led and on staff reduction focused maintenance projects.

Against this background, more and more enterprises are turning to a sustainable successful maintenance. Sustainable successful maintenance means a continuous, efficiency-increasing (operational excellence) and safety-increasing maintenance that is employee-focused. Objective of a sustainable successful maintenance is the further organizational and methodical development and thus the lasting improvement of maintenance processes. Thereby, this improvement process is not understood as once-only task that is completed after the end of a project, but one that becomes a permanent task of the organization. In the long run, it is intended to create a "learning organization."

In contrary to traditional cost-cutting concepts and derived from this, top-down projects, operation-specific solutions are provided and implemented on the basis of the experiences of own employees. Thus, a continuous improvement process (CIP) is used in a way that practicing experts contribute their ideas and knowledge on site. In addition to this "internal view," technical maintenance advisers ("external view") as well as experiences and experts from other industries (e.g. power supply and petrochemical industry) are actively involved.

Typical Success Factors

According to the experience of the authors gained in numerous well-known chemistry and pharmaceutical companies as well as at congresses, conferences and seminars, some critical success activities exist regarding the implementation of a sustainable successful maintenance.

One of these factors, in case of bottom-up projects, are precise short- and medium-term objectives that are communicated. In addition, management has to act as a coach for employees so that readiness to change and proactive thinking and acting is promoted within the organization in a systematic and methodical way. Naturally, it ranks among the fact that a possible external support goes beyond the mere submittal of Power Point presentations, but also includes specialized suggestions.

Further critical success activities in the launch period can include:

- Information workshops in combination with idea generation workshops in all involved departments
- Process walks in selected installations
- Comprehensive survey including evaluation workshops with all participants
- Work council is actively involved in all project boards and work groups

The following activities are especially important during the implementation phase:

- Piloting and testing of new concepts before the roll-out
- Assurance of the consequent implementation of identified improvement areas by establishing specialized implementation teams
- Establishing a consequent learning process on management level by e.g. peer reviews
- Definition of process-related indicators as nucleus of the implementation controlling

Practical Implementation

If one follows the proceeding to form teams from different departments and faculties, then the following topics arise:

- Maintenance strategies (preventive maintenance, RCM, …)
- Systematic weak point analysis (RCA, technical limit,…)
- Planning and cost controlling of running maintenance
- Budget controlling and scheduling of turnarounds
- Close co-operation of Operating and Maintenance Department
- Contractors Management
- Administrative overloading of employees from technical departments
- Spare part management

Following points are often judged as substantial improvements for the selection and application of an optimal maintenance strategy for critical plants and components e.g.

- Development and employment of a pragmatic procedure to justifiable internal expenditure
- Derivation of strategies taking into consideration costs and risks
- Creation of transparent decisions
- Involvement of all responsible employees with their knowledge (technology and operating)

Regarding planning and cost controlling of the current maintenance the following points are seen:

- Clearly defined and manageable responsibilities ("roles") determined
- Demand-oriented reporting developed for the management
- Visualization of characteristic numbers for the employees and elaboration and introduction of a priority matrix for maintenance notifications and orders (see fig. 2).

Survey Partcipation

In order to support and develop the concept of "sustainable successful maintenance," the empirical survey "Status-quo as well as tendencies in the development of maintenance in internationally operating enterprises" is being conducted by the authors. Enterprises interested in participating in that survey are welcomed.

The core of the external service management often outlines a practical implementation of defined to-be processes. Significant improvements of the external service management were:

- Definition of an obligatory level for the quality of order of external services
- An obligatory and site wide harmonized process for external service handling
- Consistent using of the available IT-support
- Systematical cost controlling of the Top 10 maintenance groups of each plant

The developed best practice solutions for the improvement areas are tested regarding their practicability and then transferred to other chemical facilities.

The Road to Maintenance Excellence

On the way to a sustainable successful maintenance, a consistent and continuous implementation of the elaborated solutions is necessary. Organizational, methodical and process-orientated instruments are used for this. At first, several methodical instruments are usable for an efficient implementation-controlling. In particular, process indicators are used to promptly point out whether the introduced processes run goal-orientated or whether countermeasures have to be quickly initiated. In order to ensure comparability of the separately determined indicators, general rules for determination, compilation and usage have to be set up and implemented.

In medium-term, these process indicators are transferred into a balanced scorecard (BSC) derived from the enterprise and maintenance department objectives.

An additional significant instrument for implementation controlling is the peer review. This is used to detect the level of implementation and process improvements for each site in comparison to the indicator development and if necessary to work out additional measures with the affected site.

For peer reviews, it's important that all involved people are aware of the same tenor:

- We are on the way to a learning organization.
- We are not perfect, but we are actively working to become better step by step.
- We are running a learning process and it is necessary to run a positioning time by time.
- An important part of the learning process is the comparison of the self and external perception of the site.

With the tenor of the peer reviews, the described instruments above and the conceptional layout, a learning culture will be established, following the vision of a learning organization.

Summary

The above-described concept with its approach and the implementation measures is based intensively on the experience of the own employees and is designed as a bottom-up approach. The concept is based on a continuous improvement process with the involvement of local senior experts in the analysis of processes and generation of ideas. Senior experts from other industries (e.g. power supply, petrochemical industry) were involved for introduction of external expertise.

The positive experience through peer reviews during the phase of implementation controlling demonstrates that a learning culture could be established within the organization. This affects the process of continuously elaborated and implemented improvements.

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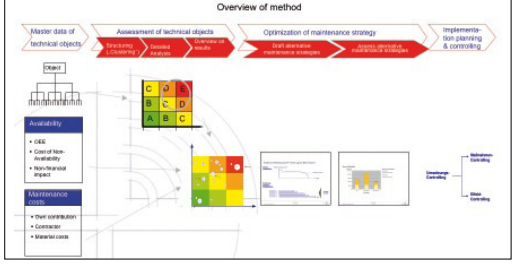
Practical implemented RCM (PIR) Fig. 1



The priority matrix makes the determination of priority rates for maintenance orders more objective Fig. 2