

CCM Fertilizers

Transforming fertilizer manufacturing from art to science

Chemical Company of Malaysia Berhad (CCM) has had a significant corporate presence in Malaysia since 1966. It is currently a responsible and independent Malaysian company, enhancing the quality of life for all.

CCM's core business activities include: Chemical products and applications, Fertilizers and technical advisory services, Pharmaceuticals and healthcare products and services.

There are four plants within the Fertilizer company (CCMF) producing compound fertilizers used primarily in Palm oil and rubber plantations in addition to other agricultural uses. The project was focused at the oldest of the four plants, in Shah Alam.

ANALYSIS

In addition to its aging condition, the change from liquid to solid handling added pressure on the production output and raw material usage levels. To remain viable, it was essential that CCMF increased its output and at the same time, reduced costs by improving usage of raw materials. Renoir was engaged to help CCMF to ensure that the plant performed at optimum levels, producing higher volumes at lower cost.

PROJECT APPROACH

The 'OPTIMUS PRIME' Project focused on increasing Output by improving Production, Planning and Maintenance and reduce excess usage of Raw Material by improving Supply and Quality Management.

PROJECT INITIATION

Production at CCMF was impacted by four losses: Planned, Downtime, Speed and Quality, resulting in a baseline OEE of 68%:

Maintenance was a key area impacting both planned and unplanned losses. Key systems and tools were implemented in the Planning and Execution systems:

- **Planning:** Routine shutdown planning and review in Microsoft Project; revamping the maintenance planning system, architecture and job library; spares planning; maintenance daily/weekly schedules
- **Execution:** Detailed routine shutdown review; RCA of breakdowns; PM compliance monitoring, line walk check and MBWA

Key results in Maintenance included:

- Planning Accuracy: from 78% to 86%
- Preventative Maintenance Compliance: from 26% to 90%
- Ratio of Preventive vs. Corrective Maintenance improved to 72%

The improvements in Maintenance resulted in Plant availability improving from 78% to 96%.

"Transforming fertilizer manufacturing from art to science, that's what OPTIMUS PRIME is all about. I can see that ownership and a culture of excellence have been developed."

En Mahmood Youp
Director, CCM Fertilizer Division

Key Results

Project ROI: 6.5 to 1

Inproject achievement of behavioural change targets

Output increased by 14 %

Yield increased by 4.2 %

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The Speed Loss issue was addressed, primarily by:

- Defining the bottleneck heat transfer layout
- Regular measurement of heat transfer in bottleneck equipment for close monitoring and control

Overall improvements in Production, Planning and Maintenance resulted in:

- OEE improving from 68% to 80%
- Planned Loss from 10% to 8.9 %
- Unplanned Loss from 13% to 7.8 %
- Speed Loss from 4% to 3.8 %
- Quality Loss from 6% to 3.2 %
- Productivity improved by 13 %
- Output improved by 14%

Raw material usage was impacted by:

- Nutrient strength loss @ 2%
- In Process Nutrient giveaway @ 5%
- Finished weight loss @ 1%

The key areas of focus were Quality and the Procurement department.

Some of the key systems and tools implemented in Quality were:

- Usage of Statistical Process Control (SPC) for close monitoring of Nutrient usage
- Online Control charting for Nutrient usage trends
- Logic Decision Guide to make and log decisions for nutrient control
- 7 SPC sins used as a quality wizard
- Finished Bag Weight Variance

Some of the key systems and tools implemented in Supply were:

- A Vendor Rating Database of Quality, Price, Delivery, Service and Support to control record & monitor
- A Vendor Rating Scorecard and continuous monitoring to improve quality
- A Kraljic Matrix to identify supplier strength and strategy

Key Project results in Raw Material Usage included:

- In Process Raw Material giveaway reduced from 5% to 0.72%
- Raw Material nutrient strength giveaway reduced from 1.5% to -3.7%
- Finished Weight giveaway reduced from 1% to 0.32%

The improvements in the end to end value cycle of nutrient usage resulted in a yield gain of 4.2%.

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