

CHEMICAL SECTOR CASE STUDY

BACKGROUND

The NCPC-SA recently embarked on a CP project with East London based plastic recycler Collectall. This Company was identified and selected through a collaborative effort between the NCPC-SA and Plastics Federation of South Africa. The project formed part of the NCPC-SA's chemical sector CP programme. The project initially included an introductory training session on CP to the management staff. This was followed by CP assessments of the Company's production process.

CHALLENGE

An initial visit of the site showed potential risk of the site for fire due to lack of proper raw material handling and storage system. Production output was running at approximately 50% of design output due to desperately needed refurbishment of extruder equipment.

SOLUTION

The NCPC-SA conducted a CP assessment of the Collectall. The assessment included a quick scan and walkthrough to identify the key areas with opportunity for CP intervention. The assessment was undertaken in collaboration with the plant engineer responsible for maintenance and stock handling.

From the quick scan the following key areas with opportunity were identified:

- **ENERGY**
 - Potential for the installation of soft starters or variable speed drives on motors
 - Substitution of electrical heating of wash plant water with energy from screen burning process flue gas
- **MAINTENANCE**
 - Refurbishment of extruder barrels and screws to increase production output
- **PROCESS OPTIMISATION AND ELIMINATION OF BOTTLENECKS**
 - Review of washing plant to increase the throughput capacity to match extruder throughput
- **RAW MATERIAL AND STOCK MANAGEMENT**
 - Implement better stock sorting and management system thereby reducing excess stock and minimising risk of fire

RESULTS

Based on the detailed evaluation of the opportunities identified from the quick scan, the following options and projected savings were determined.

CP Option	Annual Resource Saving	Annual Financial Saving
i. Installation of variable speed drives or soft-starters, to decrease the electricity usage by decreasing the KVA peak demand.	Energy management, potential reduction in demand by 84kVA.	R63 000
ii. Replace electric water heating by recovering energy from the screen cleaning burning process	Energy management, reduction in energy consumption of 456 192 kWh	R76 175
iii. Implementation of regular scheduled maintenance programme (e.g. regular refurbishment of extruder screw and barrel reduces extruder demand and maintains optimum output capacity)	Energy management	R137 558
iv. Optimizing production capacity and reduction of bottlenecks (e.g. recommended installation of larger wash plant) and refurbishment of extruder screw and barrel rolled baling of sorted material for processing	Energy management	R7 423 500 (from increased production output)
v. Improved stock management, sorting of unusable material and controlled baling of sorted material for processing material for processing	Reduced risk of fire, reduced risk of contamination of groundwater and air. Although it is difficult to quantify the resource savings; a loss to fire is a serious risk to capital equipment estimated between R12 - R15 million	n/a
Total Savings		R7 700 233

The assessment suggested that with an estimated investment of R 5.5 million to address the above issues, it is anticipated that production can be doubled. With the increase in production output it is envisaged that the investment can be recovered within the first year of operation. The NCPC is currently planning follow up to monitor the implementation of the suggested options.

