

# Client Reference

## Reducing Compressor Failures

### Condenser fan services and voltage protectors



## Client Background

Our client is a retailer that trades primarily in South Africa, with a few retail outlets in other African countries.

They provide communities with food and household items at affordable prices and strive to provide excellent service.

Their range of products include fresh and frozen foods, household items, clothing, indoor and outdoor furniture and appliances.

Pragma manages the physical assets of many of their retail outlets in different regions of South Africa.

## Key Challenges

Compressor failures and replacements contribute to our client's second highest maintenance cost. Stock losses contribute to the negative impact of compressor failures.

These failures play a major role in gas/refrigerant losses; their highest maintenance cost item.

To replace a compressor is expensive, time consuming, requires a lot of effort and involves many role-players. Compressor failures increased considerably in the 2015/16 and 2016/17 financial years. The cost on compressor failures increased by R3,086,176 in 2016/17.



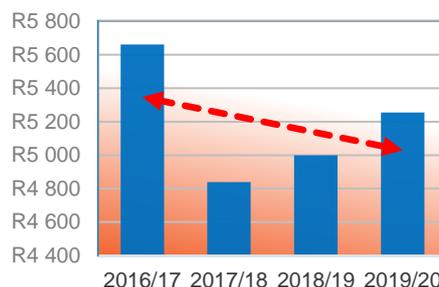
## Value Add

- The cost (year-on-year) for compressor failures increased by 21.5% in the 2016/17 financial year (FY). Since implementation, the cost **reduced** by **13,5%** in the 2017/18 FY and only increased by **5,3%** and **8,3%** in the 2018/19 FY and 2019/20 FY respectively.
- The annual refrigeration plantroom costs reduced by **R9,860 per store** in the 2017/18 FY and was still R4,888 per store less than the 2016/17 FY cost per store at the end of the 2019/20 FY.
- The total refrigeration plantroom cost increased by only 0.7% in the 2018/19 FY if the 4,6% CPI (weighted across the relevant provinces) is taken into account.
- The project realised a saving of **R4,169,017** since implementation three years ago (**R1,389,672** per year or **R7,564** per store per year).

### % increase in compressor maintenance cost



### Compressor failure cost (per store per year)



## Pragma Intervention

By following the DMAIC process and analysing the available data, the root cause of the compressor failures were identified. A remedial project was launched to mitigate the failure of compressors:

- 38% of failures occur during spring months (September, October and November). This is mainly due to the increase in heat and dust. The failures drop significantly in December (67 to 37 failures) due to the yearly services being conducted in November.
- Improvement: Condenser fan services are conducted in July. The contractors cleaning/servicing the condensers are tasked to also do a plantroom assessment as part of the service. The assessment report identifies the aspects that need to be addressed during the November major service.
- By doing the recommended condenser fan service, one of the two major failure types (mechanical) is reduced (condenser fan inefficiencies cause the compressors to run warm and seize).
- 42% of failures are electrical, majority of which are caused by power surges.
- Improvement: An additional task was added to the yearly service that requires testing of the voltage protectors installed on the compressors. This task indicates whether these protectors are effective in preventing power surges from causing major damage to windings and contactors.

The project realised a saving of **R4,169,017** over the last three financial years

## Tools and Technology

- Pragma On Key Enterprise Asset Management system
- The Pragma Field Engineering Application (FEA)