

# REPORT FOR NESTLE (UK), HAYES COMPRESSOR FIVE

## Reasons for Report

The purpose of this short report is to present the data collected from the 90kW motor running compressor five, a Bellis and Morcom reciprocating unit developing 7bar for the coffee facility, this so as to demonstrate the impact of the EnviroStart motor energy controller on the system energy consumption.

## Basic Methodology

Compressor five runs in a varying load state throughout the working week. It spends a significant, (greater than 50%), of its operating time in an off load condition. It was planned that as the feed to the system was balanced that a calibrated SPC1 data logger be placed on one of the phases for a four-day period of which one half would be with EnviroStart optimisation enabled, the other period with EnviroStart optimisation disabled.

The respective data collected would show any change to the mean current at a given power level thus reflecting any savings that could be made through the use of EnviroStart.

## Qualification of Data

It is recognised that EnviroStart is a dynamic controller which will give greater percentage energy savings whilst the system to which it is applied is off load than it will whilst that same system is more closely loaded to its maximum capacity.

Prior to the data logging activity, a number of spot checks were made with a NanoVip to establish what the mean power levels were in each load state of the system. The measurements taken at these “spot times” correlated closely, (within 1% mean), with the data collected by the data logger and presented here.

## The Measurements

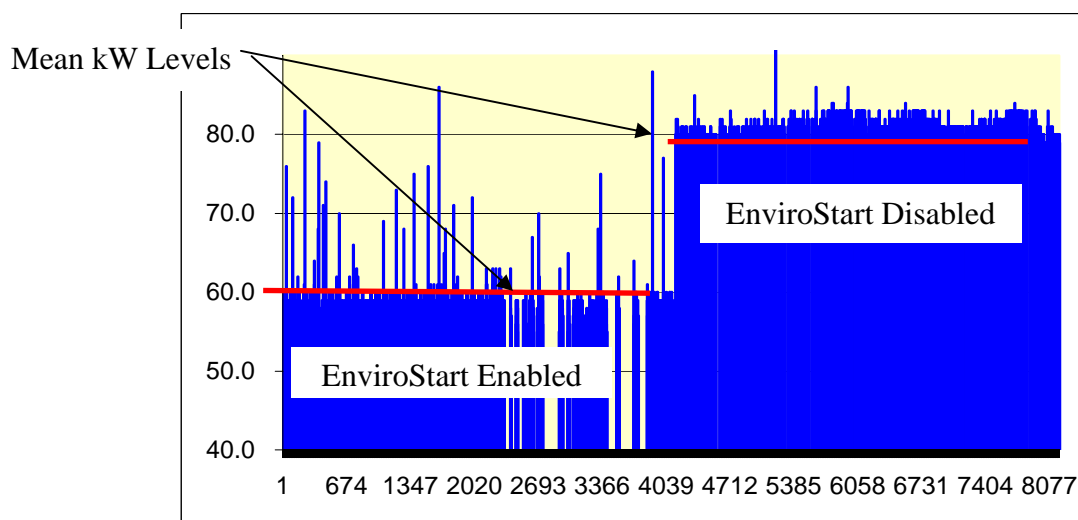
The data collected throughout the period of the investigation, 14<sup>th</sup> through 18<sup>th</sup> May 2002 showed periods of off load, intermediate load and full load. For the sake of clarity the intermediate load and full load condition data points were eliminated from the graphed information as they were:

1. short term only
2. infrequent

As the data that was collected was contiguous throughout the period it is clear where data has been eliminated.

The mean levels established for the purpose of identifying percentage savings did not count the “zero” data points and relied only on the means of the positive data points measured during the given period.

## kW Against Time



During the period of the investigation the load levels changed from a calculated mean of 62kW to 79kW. This data shows a saving of > 22% in the off load condition of the compressor.

Though limited in sample size the savings in the on-load state were also calculated and showed a saving of 16% between the optimisation enabled and optimisation disabled state. Statistically this information is invalid because the data count is too small to be recognised as relevant within acceptable criteria. (It is however consistent with results achieved on other similar compressor systems).

### **Conclusions**

The simple conclusion to be drawn from the data as presented is that the EnviroStart unit provides a substantial reduction in power consumption of the compressor motor when in optimisation mode when compared to the same compressor running without optimisation enabled.

### **Payback Assumptions:**

Based on the logged data the mean savings given will be  $\geq 22\%$ . Based on given energy costs of £0.029p/kWh on site, overall running time per annum of 15hrs/day for 230 days/year and the current price of a EnviroStart being 400-TPMEC-90 of £2,460/unit the payback period calculated will be  $\leq 1.41$  years.

21<sup>st</sup> May 2002

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