Case Study

6 Areas of Motors monitored 24/7 (plus Bearings & Gearboxes)

Exhaust Fan Motor
200KW – IE3
207 Amps rated
155 Amps optimum
30 day trace – 94 Amps actual

Hot Stone Elevator Motor
45KW – IE3
72 Amps rated
54 Amps optimum
30 day trace – 52 Amps actual

RAP Elevator Motor
22KW – IE3
39 Amps rated
29 Amps optimum
30 day trace – 22 Amps actual

Mixer Motors
55KW – IE3
96 Amps rated
72 Amps optimum
30 day trace – 62 Amps actual

Trunnion Wheel Drive Motors
22KW – IE3
39 Amps rated
29 Amps optimum
30 day trace – 35 Amps actual

Filler Elevator Motor
22KW – IE3
39 Amps rated
29 Amps optimum
30 day trace – 22 Amps actual

Cost Savings & Benefits

Overheating & Vibration are proven to reduce rotating components lifetime

Overheating & increased vibration in Bearings & Gearboxes can indicate, lubricant failure

Average motor life is 30,000 hours (3 ½ years) - insulation life is reduced by 50% when overheating & over current conditions occur

Cost Saving 1)
Motor cost & replacement time

Cost Saving 2)
Reduced Downtime

Cost Saving 3)
By taking an inefficient motor out of service, there is an electricity saving & reduction in CO_2.

Benefit 1)
The client will tend to purchase replacement Motors/ gearboxes/ Bearings from the company monitoring plant performance

Component lifetime is increased by early warning of performance issues

Motors/ Gearboxes/ Bearings replaced during planned downtime & not unplanned stoppage

Reduced running/ electricity costs, due to Early Warning of problems

Benefits to customers in Sustainability & Net Zero targets

Case Study

Trunnion Wheel Drive Motors

22KW Nord 3 Phase Motor x 4 – IE3 – 400V – 39.3A

Energy

Optimum loading is 75% = 29.5Amps
ACTUAL (taken from TCE Monitor Dashboard) = 35Amps

KWH Calculation - Amps x Voltage x Hours/ 1000 = KWH

29.5 x 400 x Hours/1000 = 11.8 KWH

Electricity cost supplied by client = £0.37 per KWH

Running cost optimum = £0.37 x 11.8KWH = £4.37/ hour
Running Cost ACTUAL = £0.37 x 14KWH = £5.18/ hour

24/7 operation = 732 hours per month

Running Cost Optimum = £3198
Running Cost ACTUAL = £3792

Extra Running Cost per Motor = £593 (x 12 months) = £7116

CO2

Optimum = 2.8kg = 2049kg
ACTUAL = 3.2kg = 2342kg

Extra CO2 = 293kg = 0.293 Tonnes x 12 months = 3.5 tonnes

ROI Calculation

57 Asphalt Plants

Cost of TCE Monitor @ £20,000 per site (Dryer/ Mixer/ Elevators/ Screen) = £1.140,000

Electricity Saving = £28,464 per Dryer x 57 = £1,622,448

50% Increase in Motor life – average cost of 22KW Nord Motor = £3000. 4 x £3000/2 = £6000 x 57 = £342,000

Resultant verified cost saving = £1,964,448 - £1,140,000 =

£824,448

Case Study 2

RAP Elevator Motor

9.2KW Nord 3 Phase Motor – IE3 – 400V – 9.65A

Energy

Optimum loading is 75% = 7.23Amps
ACTUAL (taken from TCE Monitor Dashboard) = 22Amps

KWH Calculation - Amps x Voltage x Hours/ 1000 = KWH

7.23 x 400 x Hours/1000 = 2.9 KWH

Electricity cost supplied by client = £0.37 per KWH

Running cost optimum = £0.37 x 2.9KWH = £1.07/ hour
Running Cost ACTUAL = £0.37 x 8.8KWH = £3.26/ hour

24/7 operation = 732 hours per month

Running Cost Optimum = £783
Running Cost ACTUAL = £2386

Extra Running Cost per Motor = £1603 (x 12 months) = £19,224

CO2

Optimum = 0.68kg = 498kg
ACTUAL = 2.05kg = 1500kg

Extra CO2 = 1002kg = 1.002 Tonnes
x 12 months = 12.02 tonnes

ROI Calculation

57 Asphalt Plants

Cost of TCE Monitor @ £20,000 per site (Dryer/ Mixer/ Elevators/ Screen) = £1.140,000

Electricity Saving = £19,224 per RAP Elevator x 57 = £1,095,768

50% Increase in Motor life – average cost of 22KW Nord Motor = £3000/2 = £1500 x 57 = £85,500

Resultant verified cost saving = £1,181,268 - £1,140,000 =

£41,268