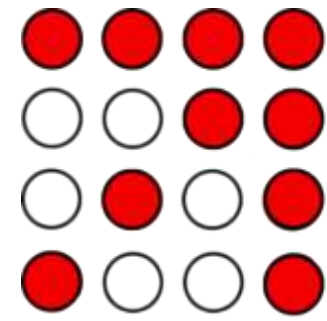


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ANA-DIGI SYSTEMS

Process Automation Solutions

“Optimization of Manufacturing Processes and Energy Consumption”

Presented by

Brett Smith
Chief Executive Officer

Mornay Steyl
Chief Technical Officer

Energy Efficiency and Reliability in Industry

Cutting Energy Costs by Up to 60% with Ana-Digi Systems

www.anadigi.co.za



Optimizing Your Energy Strategy

Given the highly competitive nature of the any industry, reducing costs and enhancing efficiency are critical priorities for mining operations.

Ana-Digi Systems has positioned ourselves as Energy Management Consultants that specialize in assisting organizations to optimize their energy use, reduce costs, and improve sustainability. Which also offers a proven, cost-effective alternative to traditional energy generation methods.

Optimizing Existing Energy Usage:

- The often-overlooked, yet highly effective approach is optimizing your current energy usage. This is where Ana-Digi Systems excels. As energy management consultants, we offer solutions that can reduce your energy costs by up to 60%.

While generating your own electricity might seem appealing, the costs and time involved in setting up such systems can be prohibitive. On the other hand, optimizing your existing energy usage offers an immediate impact on your bottom line.

Case Study

3 x 6.6kV, 3.2 Mw Medium Voltage Drives was installed in the Free State. They were used to operate the existing motors and optimize the speed control to maintain the required air quality in the mine shaft.

Key features of a MVDs:

- Motor speed control
- Soft start capabilities to reduce mechanical stresses
- Real-time adjustment of speed based on demand
- 1 MV Drive is on standby

Before Implementation:

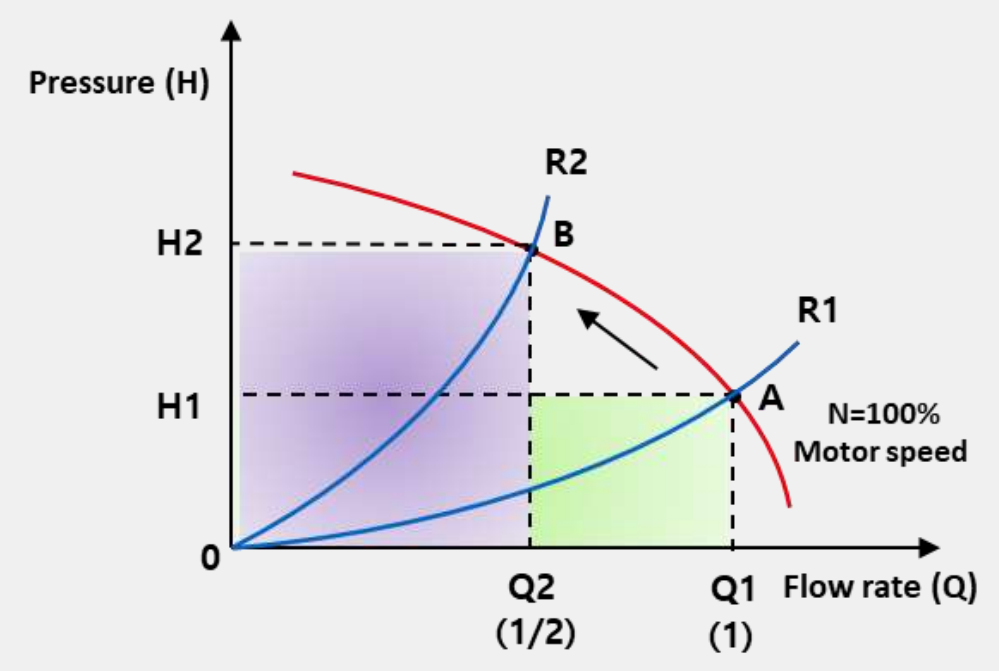
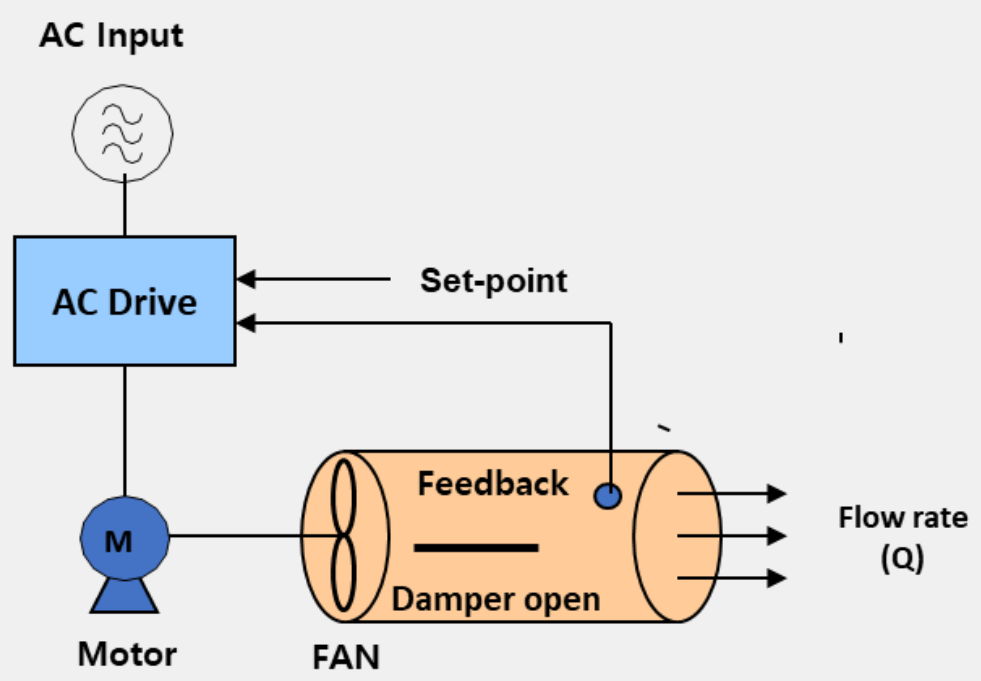
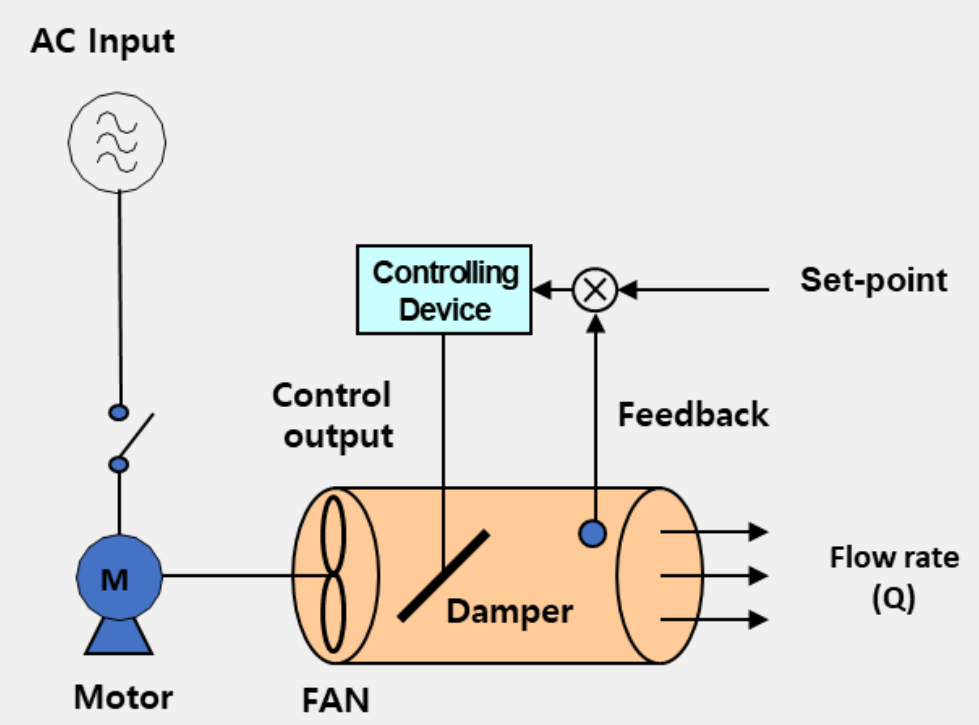
- Yearly Cost of Energy: R21 million

Consumption after Implementation:

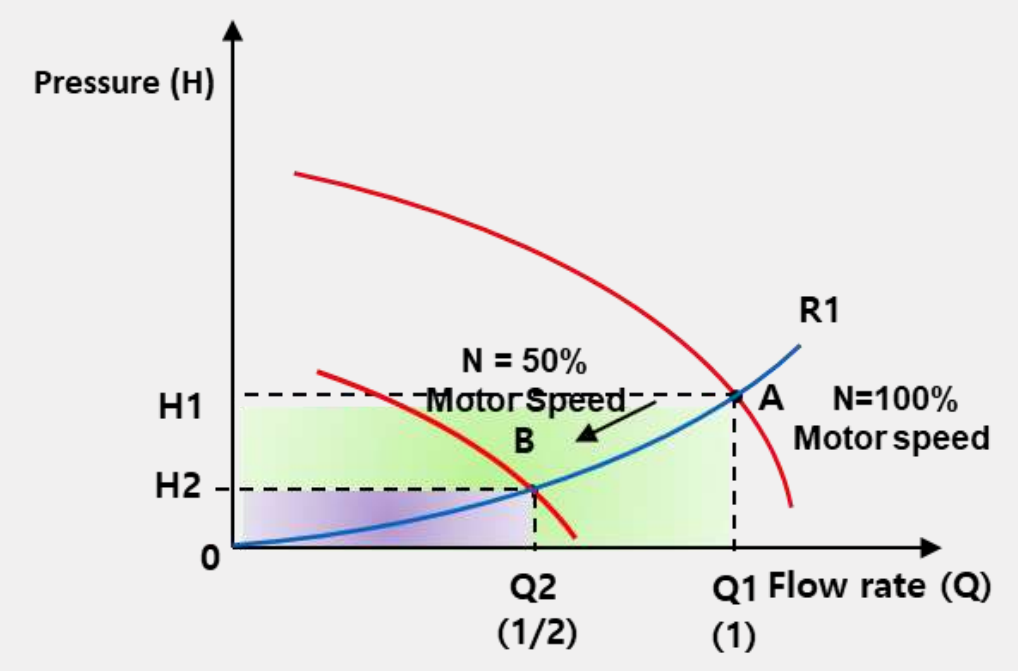
- Energy Saving: 1.2MW per unit (40% saving)
- Yearly Cost of Energy: R11 million
- Cost of MV Implementation: R19 million

Yearly Cost of Energy SAVINGS = R10 000 000.00 (per x2 MVD)

Maintenance Cost Saving = R1 200 000.00



Damper Control



AC Drive Control

The savings is a result of:

- Removal of dampers contributes 4.4% in energy saving.
- Adjustment of fan speed in real time.
- Efficient use of energy during low-demand periods.
- 25% reduction in maintenance costs.
- Decrease in CAPEX costs due to reduced mechanical stresses (wear and tear).
- Variable fan speed enables user to reducing power consumption. Because power consumption is proportional to the cube of the speed resulting in a energy 1.2MW saving.

Investment

Cost of x3MV Drive (one on standby):

R19 Million

Payback Period:

It took the mine approximately **10months** to pay off the initial equipment cost! (Asset is paying for it self)

Long-Term Financial Impact:

Projected 10-year net financial benefit: Estimated R200 million.

Summary:

- Significant energy and maintenance cost savings.
- Extended equipment life and improved power quality.
- Strong ROI with substantial long-term financial benefits.

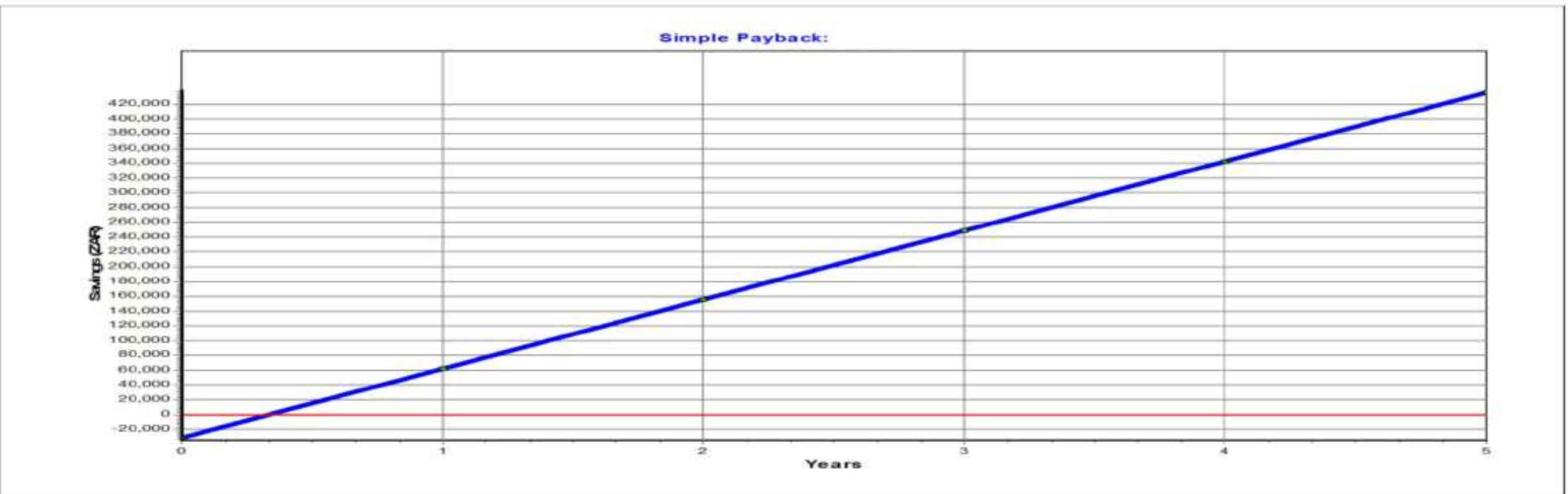
Concept of Energy Reduction using VFD on 20 kW Motor



Utility:	Eskom	Alternate Rate:	ZAR 1.000
Cost per kWh:	ZAR 1.000	Utility Incentive:	ZAR 0.0; One-time

Date: 2012/04/10

Estimated Energy Savings		Estimated Carbon Dioxide Emissions	
System	Energy Usage	System	Carbon Footprint
Present System:	134 MWh	Present System:	94.55 Ton(s)
VFD System:	41 MWh	VFD System:	28.65 Ton(s)
Energy Saved:	93 MWh	Carbon Dioxide Savings:	65.90 Ton(s)
Estimated Savings:		Estimated Payback Time: 0.337 Years	
Energy Saved/Year:	Total ZAR 93,480		
Yearly Savings:	ZAR 93,480		



Carbon Dioxide (CO2) savings estimation based on electricity produced from Coal at 0.705 of CO2/Kg
 Weight Units: Metric
 Calculations are based on available data. We assume no responsibility for the accuracy of the supplied data or of this report.

System Identification: 1 X 20 kW
 Type: Pump System
 Flow Control: Throttling Valve

Utility		Motor Data		Duty Cycle Information			
Cost per kWh:	ZAR 1.000	Power:	20 kW	Rate	Flow (%)	Time (%)	Time (Hours)
Alternate Rate:	ZAR 1.000	Efficiency:	95 %	B	100 %	1 %	88
Utility Incentive:	ZAR 0 per kW; One-time			B	90 %	2 %	175
Variable Frequency Drive Data				B	80 %	9 %	788
Drive Cost:	ZAR 30,000			B	70 %	17 %	1,489
Install Cost:	ZAR 1,500			B	60 %	24 %	2,102
# Systems:	1			B	50 %	17 %	1,489
Operation				B	40 %	13 %	1,139
Hours per Day of Operation:	24 Hours			B	30 %	11 %	964
Days per Week of Operation:	7 Days			B	20 %	6 %	526
Weeks per Year of Operation:	52 Weeks			B	10 %	0 %	0
Total Hours:	8,760 Hours/Year			B	= Base Rate (Cost per kWh)		
				A	= Alternate Rate		

Estimated Carbon Dioxide Emissions		
System	Carbon Footprint Single	Carbon Footprint Total
Present System:	94.55 Ton(s)	94.55 Ton(s)
VFD System:	28.65 Ton(s)	28.65 Ton(s)
Savings:	65.90 Ton(s)	65.90 Ton(s)



Payback Analysis	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Equipment Cost:	ZAR 30,000					ZAR 30,000
Installation Cost:	ZAR 1,500					ZAR 1,500
Utility Rebate:	ZAR 0					ZAR 0
Energy Saved:	ZAR 93,480	ZAR 93,480	ZAR 93,480	ZAR 93,480	ZAR 93,480	ZAR 467,399
Total:	ZAR 61,980	ZAR 155,460	ZAR 248,939	ZAR 342,419	ZAR 435,899	ZAR 435,899

Estimated Energy Savings			Estimated Savings:		
Operating Info:	Single	Total	Single	Total	
Operating Hours:	8,760 Hrs	8,760 Hrs	Energy Saved/Year:	ZAR 93,480	ZAR 93,480
Present System:	134 MWh	134 MWh	Demand Savings/Year:	ZAR 0	ZAR 0
VFD System:	41 MWh	41 MWh	Yearly Savings:	ZAR 93,480	ZAR 93,480
Energy Saved:	93 MWh	93 MWh	Estimated Payback Time:	0.337 Years	



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Thank You

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