# MPM Explorer Test Reports

Main MPM Panel

Concise overview of the operation of the motor. With one glimpse you know how the motor is operating. Power to the motor, load requested from the motor, and accurate electro-mechanical data along with the top level of the automated assessment are displayed. Are all systems green? Or do we have problems with the power to the motor, motor health issues, likely overheating or is the motor running with too poor of an efficiency?
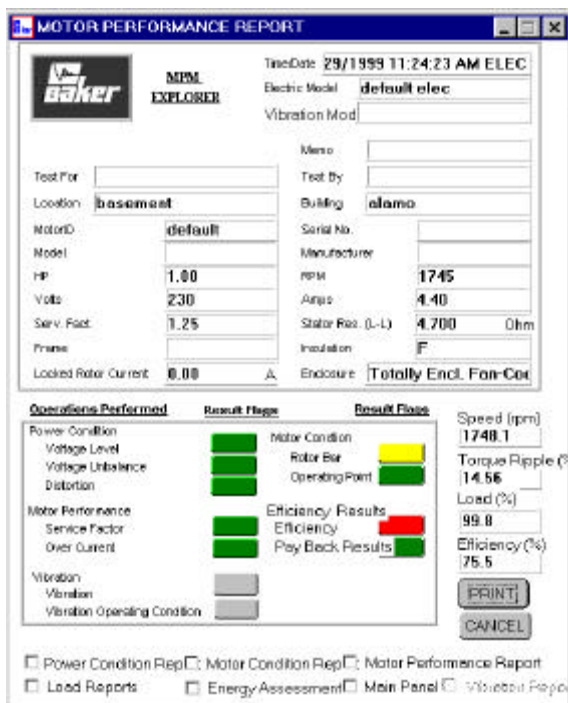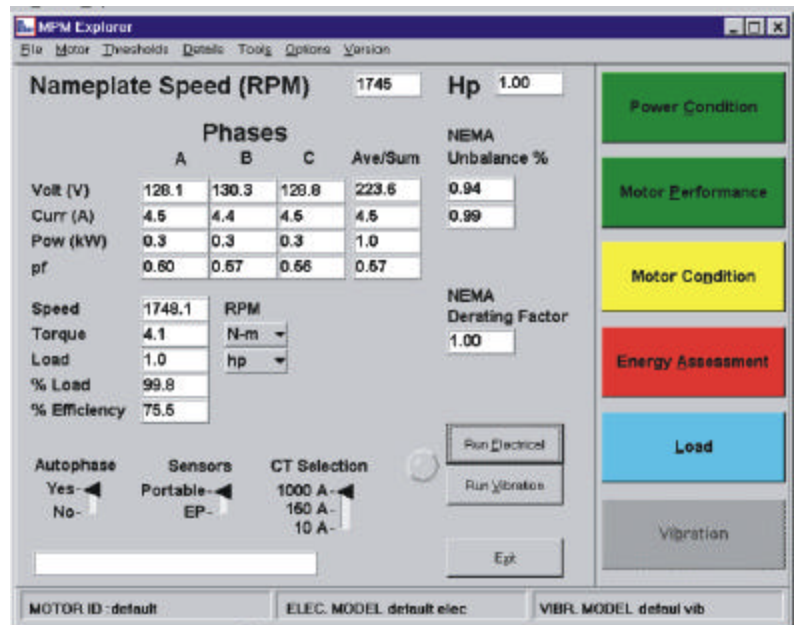

Main Print Report Screen

Summary of the performed test report. Identifies the motor and date of testing, main nameplate parameters and the results of the automated testing. Offers the option of extended test report printouts.
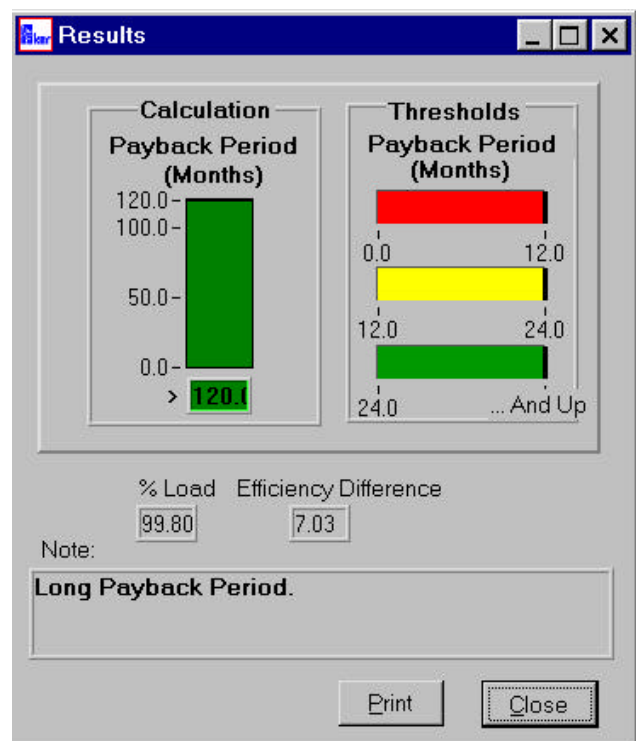
Payback Results

Identifies the simple payback period when comparing the tested motor's efficiency with EPAct compliant motors, adjusting for the operating load level. Does the payback period warrant retrofitting with a more efficient motor?
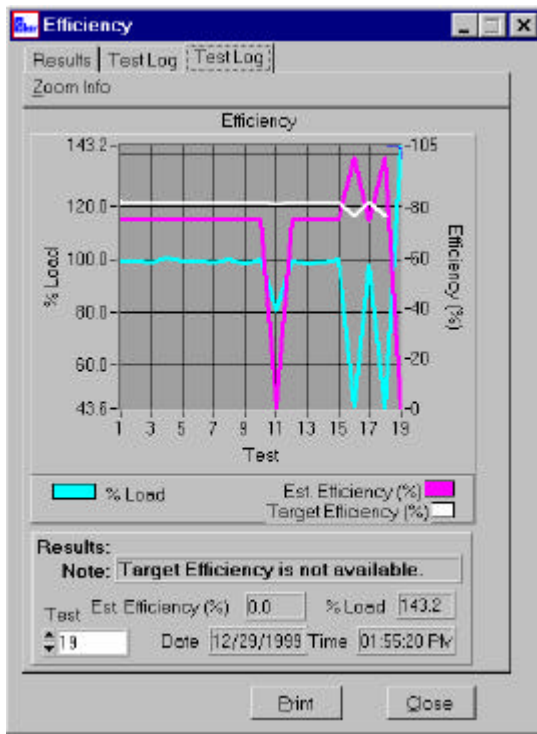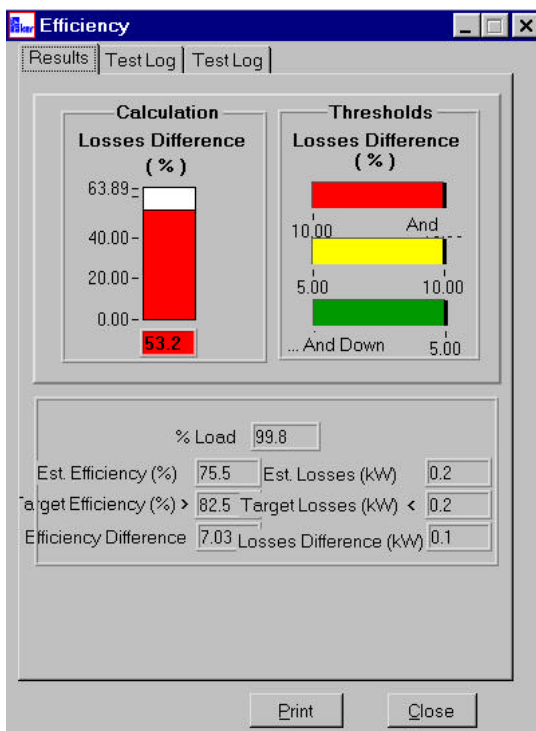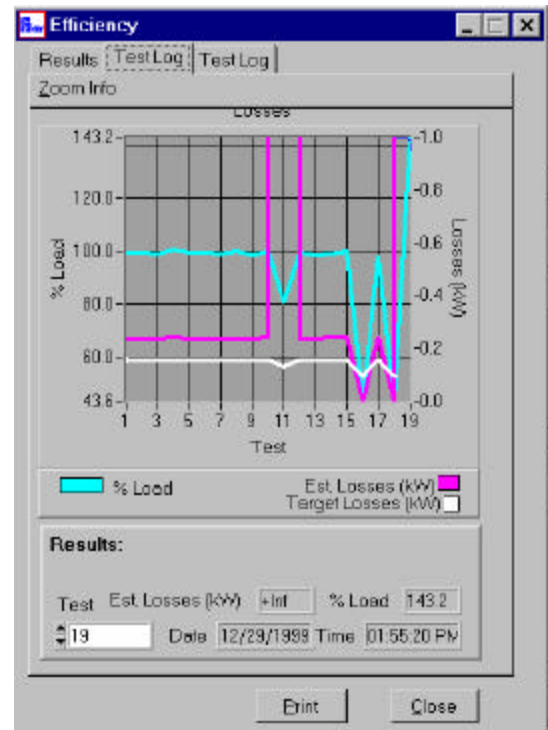
Efficiency History

Histogram of the operating efficiency and operating load plotted versus the number of tests performed on that motor. Further compares the operating efficiency with an EPAct reference, giving statistical feedback on the quality of the tested motor with respect to achievable peers.
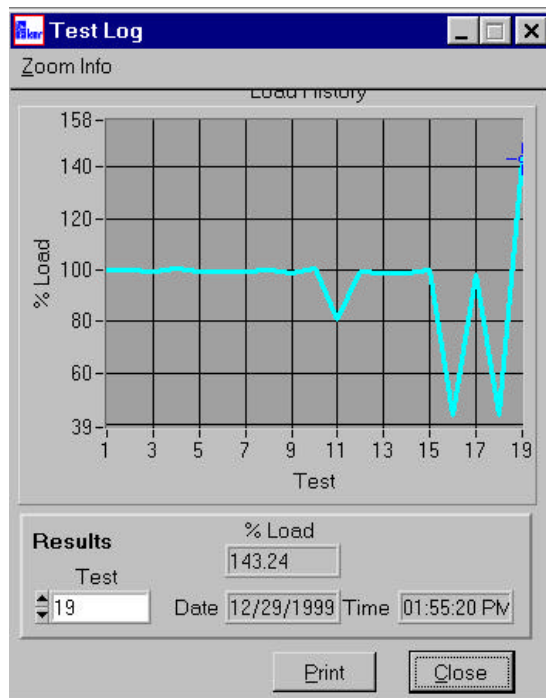
Efficiency Losses Test Log

Histogram of kW losses versus the number of tests performed on the motor. Statistically identifies potential money savings from wasted kWh compared to an achievable EPAct type quality motor.

Efficiency Results

Relates the operating motor's losses to an EPAct type motor. Identifies sub-par operating motors and points where kWh money savings are possible.

Test Log

Load History

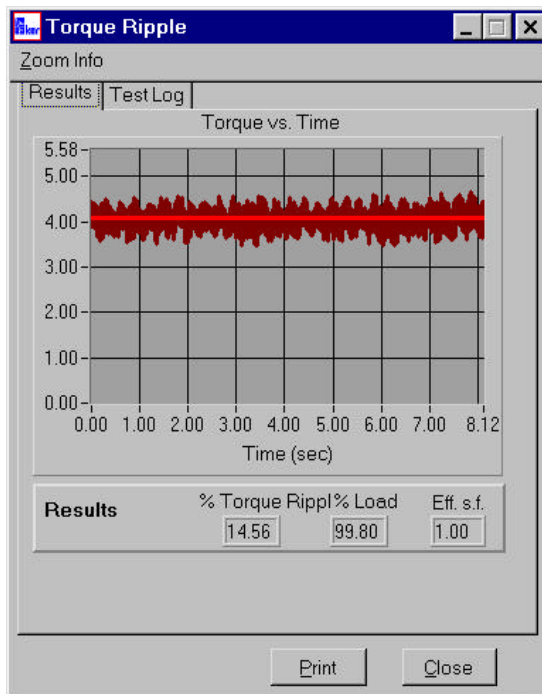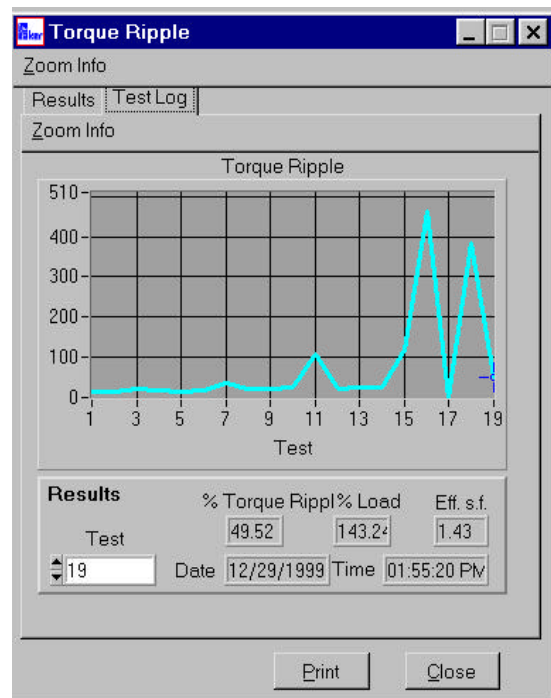| Results	% Load	
Test	143.24	
19	Date 12/29/1999	Time 01:55:20 PM

Print   Close

Load History

Maps the percentage load the motor is running versus the times the motor has been tested. This information is invaluable for root cause analysis of other conditions. Do monitored undervoltage conditions on this voltage bus correlate to high load operation on this particular motor? Is an overcurrent scenario linked primarily to an undervoltage coming from the bus or from an overload requested by this particular application?
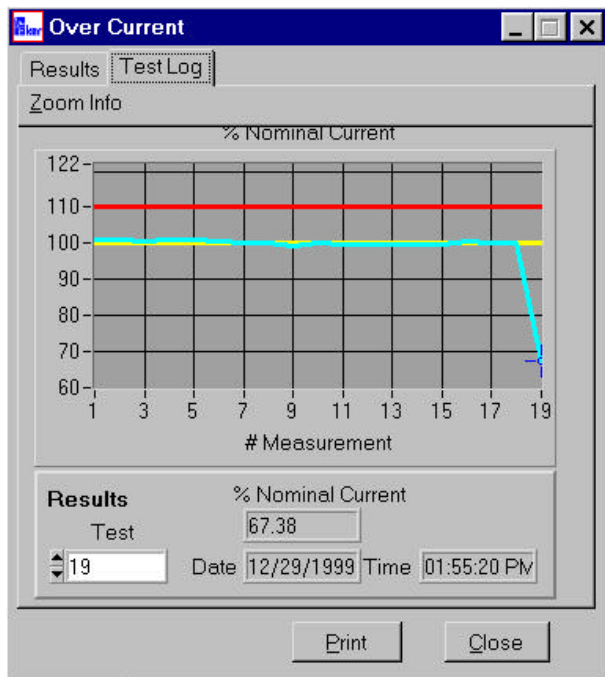
Torque Ripple History

Is the torque ripple signature (ratio of steady state torque to transient torque pulses) constant for this application? Do I have cavitation problems on this pump when it is running synchronously to the parallel system? Has the torque ripple worsened over time (pointing to increased unbalance or belt wearing.

Torque Ripple

Results | Test Log

Torque Ripple

Results	% Torque Rippl	% Load	Eff. s.f.
Test	49.52	143.24	1.43
19	Date 12/29/1999	Time 01:55:20 PM	

Print   Close

Torque Ripple

Results | Test Log

Torque vs. Time

Results	% Torque Rippl	% Load	Eff. s.f.
	14.56	99.80	1.00

Print   Close

Torque Ripple Results

Maps instantaneous torque against time, and compares it to the torque rating of the motor. Is my torque level steady? Do I have mechanical oscillations on the system (flapping belts, chattering of parallel processes)? Do I have transient impulses that exceed the rated torque greatly (stressing of shafts, couplings and rotor bars)?

Over Current

Zoom Info

% Nominal Current

122 —	
110 —	
100 —	
90 —	
80 —	
70 —	
60 —	

1 3 5 7 9 11 13 15 17 19

 # Measurement

Results   % Nominal Current

Test | 67.38 |

‡ 19   Date | 12/29/1999 | Time | 01:55:20 PM |
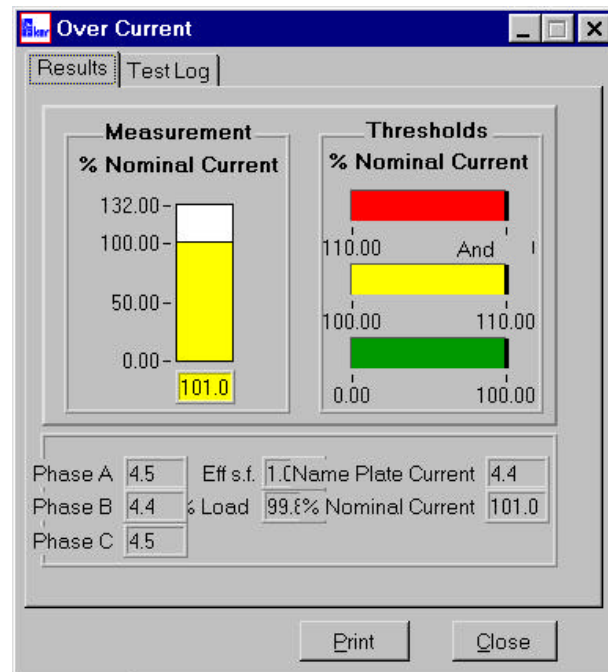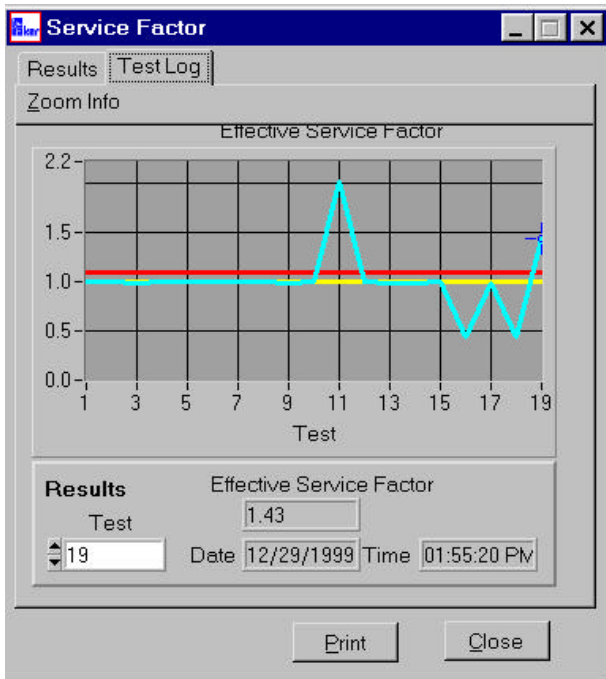
Print   Close

Overcurrent History

Is this motor typically thermally over stressed and in need of a predictive insulation system check on the next possible down time?

Overcurrent Results

Identifies whether any phase current exceeds the motor's amperage rating.

Over Current

Results | Test Log

Measurement	Thresholds
% Nominal Current	% Nominal Current

132.00 —	
100.00 —	110.00 And
50.00 —	
	100.00 110.00
0.00 —	
101.0	0.00 100.00

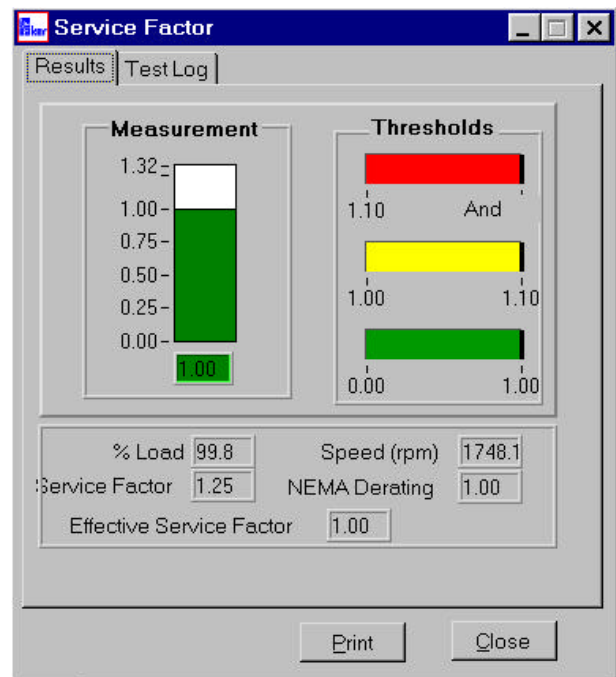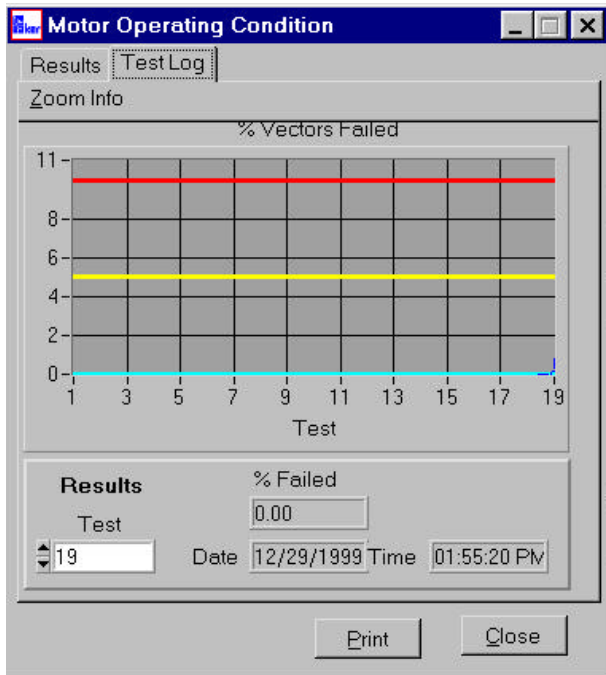|				
Phase A	4.5	Eff s.f.	1.0	Name Plate Current	4.4
Phase B	4.4	% Load	99.8%	Nominal Current	101.0
Phase C	4.5			

Print   Close

Service Factor History

Is this motor frequently running too hot? Correlate thermal stressing instances with unbalance and load test logs, to find the source of the thermal deterioration of this motor. Is the motor over loaded, or is the larger VFD on this bus causing the thermal stress?

Service Factor — Results | Test Log

Zoom Info

Effective Service Factor (graph)

Results
Effective Service Factor: 1.43
Test: 19
Date: 12/29/1999 Time: 01:55:20 PM

Print | Close

Service Factor Results

Clarifies the NEMA derating numbers. I have a poor voltage condition. Did I derate the motor sufficiently to accommodate for the heating caused by harmonics and unbalances, or is the motor running hotter then it should?

Service Factor — Results | Test Log

Measurement: 1.00

Thresholds: 1.10 And

1.00   1.10

0.00   1.00

% Load 99.8   Speed (rpm) 1748.1
Service Factor 1.25   NEMA Derating 1.00
Effective Service Factor 1.00

Print | Close

Motor Operating Condition

Results | **Test Log**

Zoom Info

% Vectors Failed

Test

Results % Failed

Test 0.00

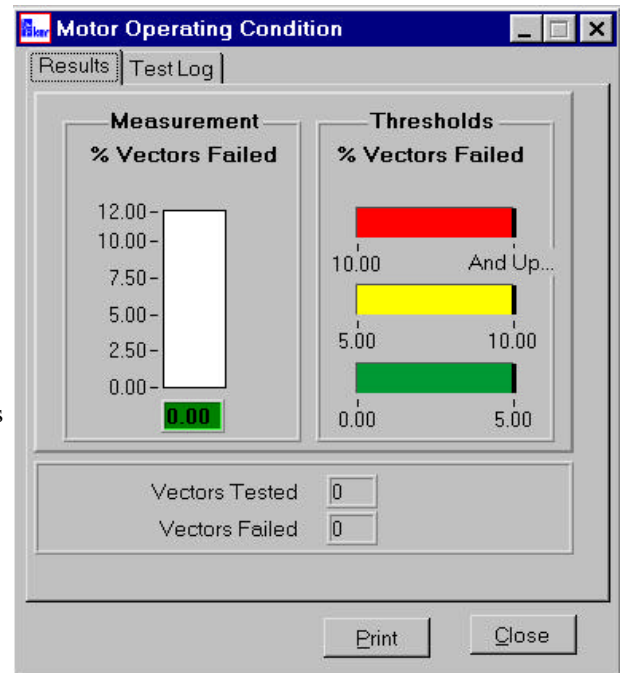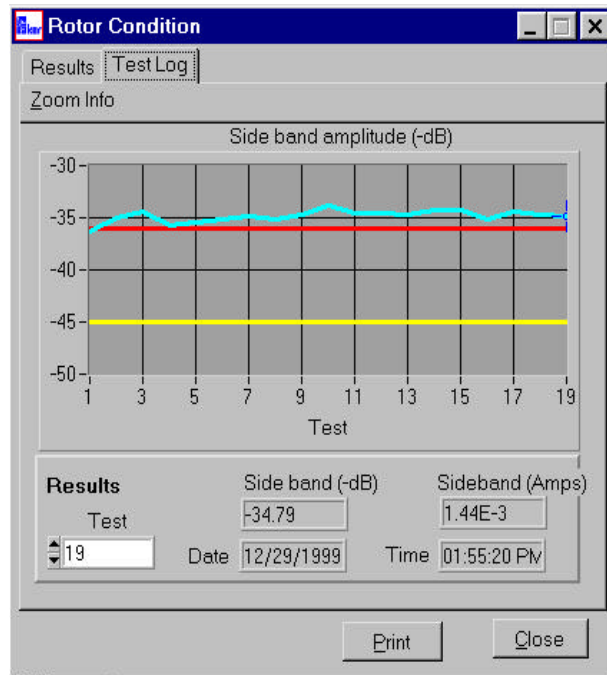↕ 19   Date 12/29/1999 Time 01:55:20 PM

Print   Close

Operating Point History

Does this motor consistently behave according to its signature? At what instance did it start showing the new behavior? Did the new behavior start when the fan was cleaned, or when the VFD was installed, or did it slowly increase? If so, does the timing of the operating condition change, correlated with my rotor bar deterioration, or with higher vibration levels?

Operating Condition Results

Extremely powerful tool that identifies whether the motor operates according to it's previous signature. Motors only deteriorate, and do not heel. In the motor world, change is typically for the worse. A new operating condition incites to delve deeper into analysis. What is causing the change? Is the fan broken, the voltage condition worse, or the rotor bar signatures worsening? Does the vibration level or the torque signature change (identifying deteriorating loads)?
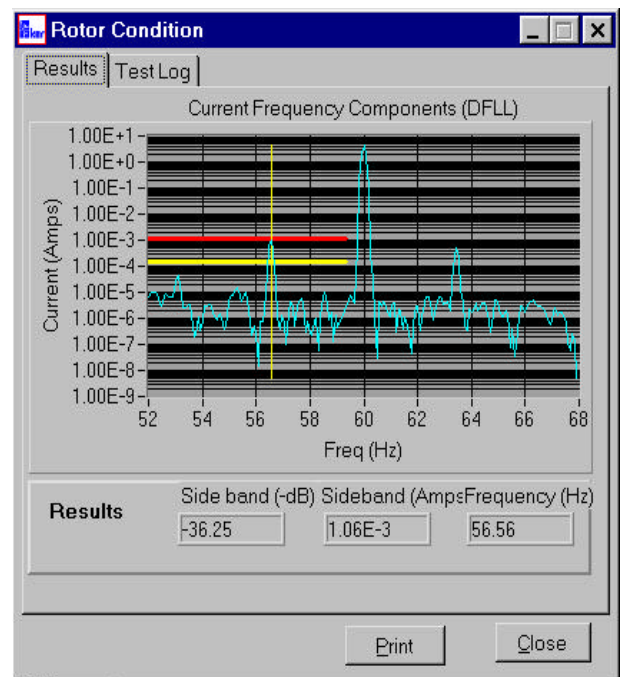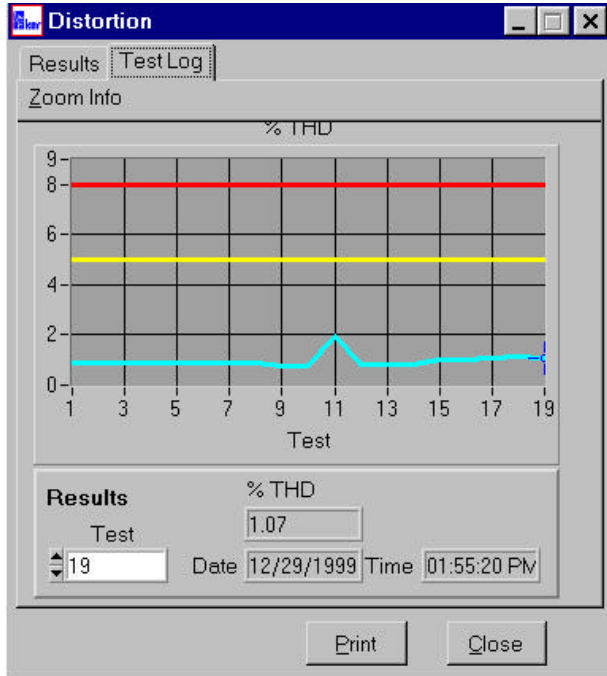
Motor Operating Condition

Results | **Test Log**

Measurement
% Vectors Failed

Thresholds
% Vectors Failed

10.00   And Up...

5.00   10.00

0.00   5.00

0.00

Vectors Tested 0

Vectors Failed 0

Print   Close

Rotor Bar History

Is my rotor condition worsening over time? At which rate?

Rotor Bar Results

Identifies the health condition of the rotor, broken or cracked rotor bars or endrings.

Distortion History

Powerful tracking record proving voltage quality deterioration on this voltage bus. Proves why motors start running hotter if increased amounts of VFD kVA are running on the same bus. Identifies with dates when the changes for the worse have happened and also whether the corrective actions/filtering took the desired effect.

Distortion Results

Identifies unacceptable levels of THD for this voltage bus. Voltage distortion, voltage unbalance and overloads are the fundamental causes for motor overheating and their electrical failures.
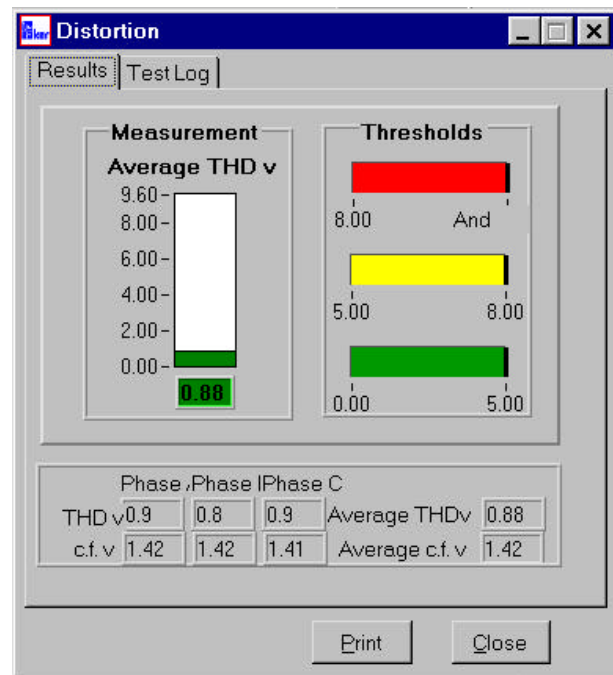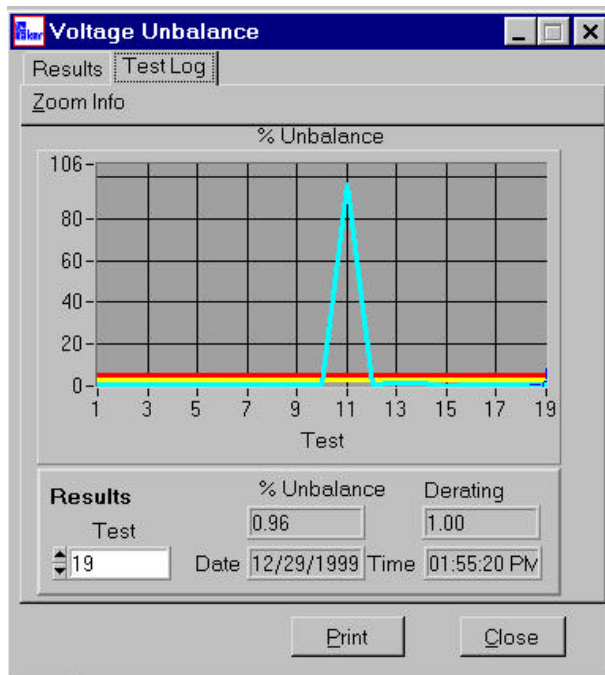
Voltage Unbalance History

Shows the level of voltage unbalance for every test run on the motor. When does my neighbor facility switch on their large single phase loads? At what times does the utility switch on their power factor correcting capacitors? What levels of unbalance are created by this and how do I react properly?

Voltage Unbalance Results

Most frequent source for poor NEMA derating conditions. Most significant source for negative sequence currents in the motor, which generate heat and retarding torques.
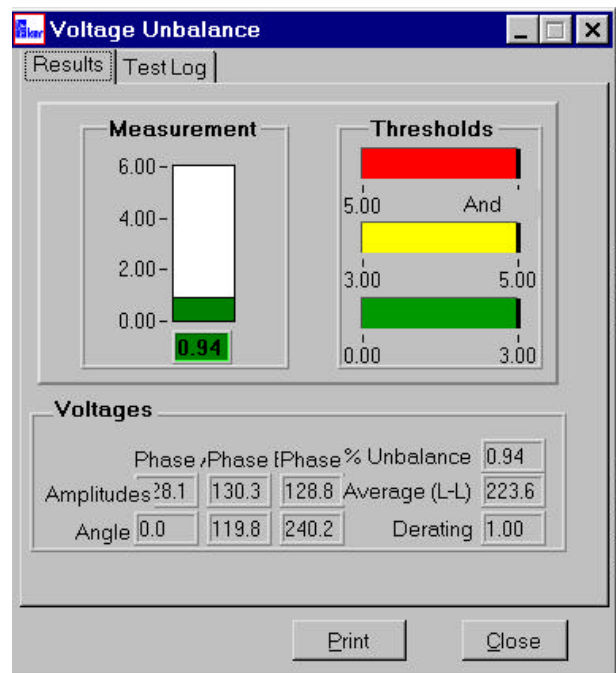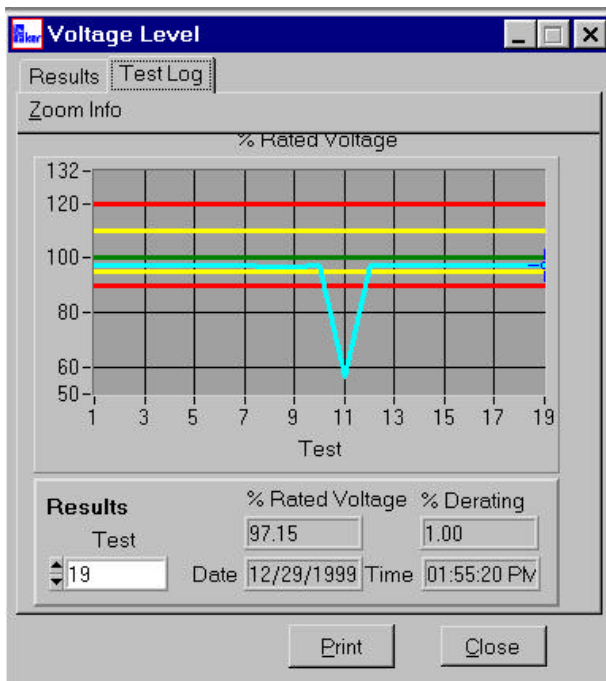
Voltage Level History

Monitors times and dates when the voltage was sagging or swelling. Displays the acceptable levels of voltages for over and under voltage conditions.

Voltage Level — Results | Test Log

Zoom Info

% Rated Voltage

(graph with Y-axis: 132, 120, 100, 80, 60, 50; X-axis: Test 1 3 5 7 9 11 13 15 17 19)

Results

	% Rated Voltage	% Derating
Test	97.15	1.00

Test ⇕ 19   Date 12/29/1999 Time 01:55:20 PM

Print   Close

Voltage Level Results

Displays the percentage of over or undervoltage on that bus. Undervoltage conditions rapidly cause overcurrents, while overvoltage conditions generate saturation on the motor's iron, which increases the core losses and strongly diminishes the power factor of the motor, ultimately increasing the operating losses.

Voltage Level — Results | Test Log

Measurement
Under Voltage (%)
12.00 – 10.00 – 5.00 – 0.00
2.80

Thresholds
Under Voltage (%)
10.00   And
5.00   10.00
0.00   5.00

Voltages

	Phase A	Phase B	Phase C	
Amplitudes	28.1	130.3	128.	Average (L-L) 223.6
Rated (L-N)	132.8		Rated (L-L)	230

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