

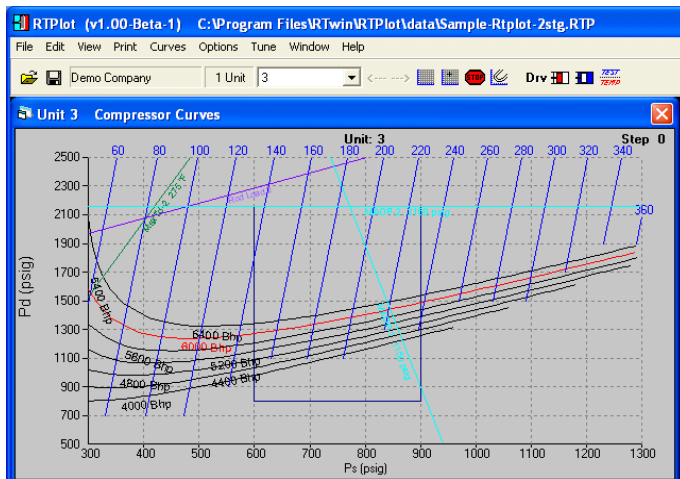
PERFORM for RTwin

Performance Testing Software

Field performance testing and load curve generation software using RECIP-TRAP and RTwin.

What does PERFORM Software do?

- Measures actual compressor performance as installed.
- Calculates corrected performance over the entire operating range of the unit.
- Draws horsepower and capacity curves from empirical data.
- Produces theoretical operating curves.
- Provides control system coefficients for load and capacity control.



Why use RECIP-TRAP system with PERFORM?

- ✓ Fast and accurate data collection
- ✓ Single H/W and S/W system produces curves from start to finish
- ✓ Automates generation process
- ✓ Automates verification process

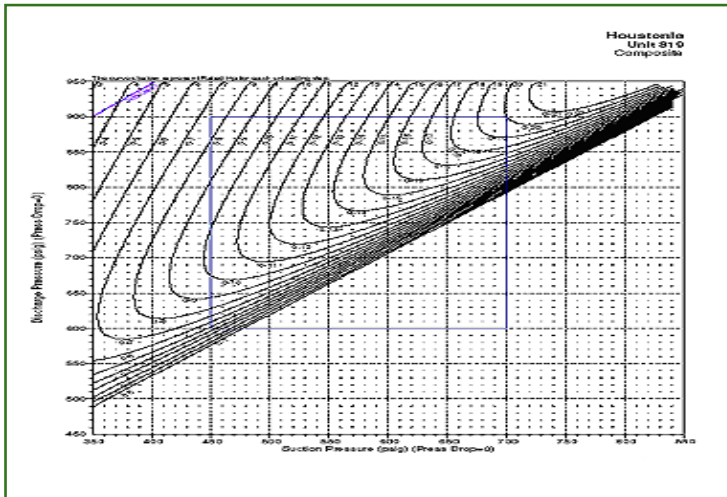
Benefits of using PERFORM Software

- Large reduction in data collection effort.
- Much less elapsed time. One trip to the field and the curves are developed and verified.
- 5 - 20% more accurate than theoretically developed curves or manufacturers curves.
- Provides information needed for the most efficient deployment of compressors.
- Eliminates load related failures.
- Helps to identify opportunities for additional capacity without the need for additional capital expense.
- Accurate horsepower provides for better and more appropriate emissions permitting.
- On a fleet-wide basis, accurate predication of horse power and capacity makes system modeling and nominations more accurate, which makes your company more competitive.

PERFORM features and functionality:

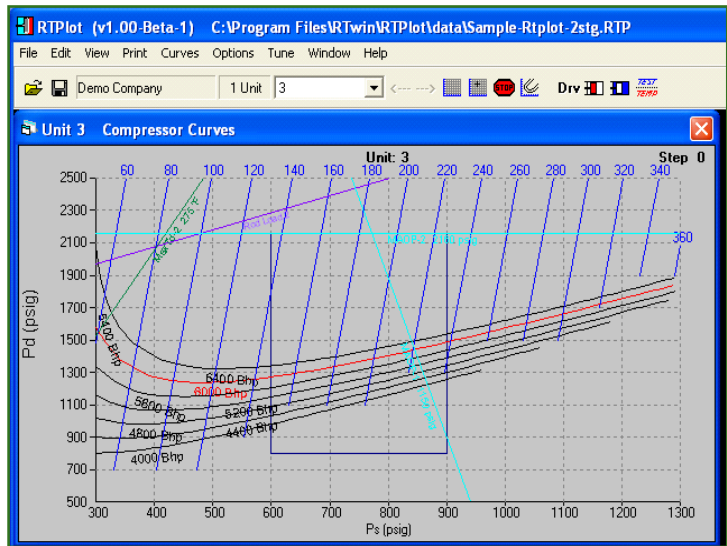
Full Load Curve

The full load graph allows the operator to determine the loading configuration necessary to attain maximum load at any given suction and discharge pressure. This assures that the unit is safely loaded to its actual capacity.



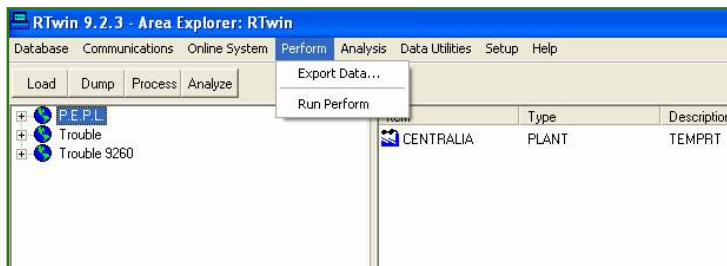
Load Step Curve

This curve is a single load step curve. The operator can determine exactly what the horse power and flow is at any operating point. The graph also show the violation limits for conditions such as excessive rod loads or maximum operating pressures, and temperatures.



Area Explorer

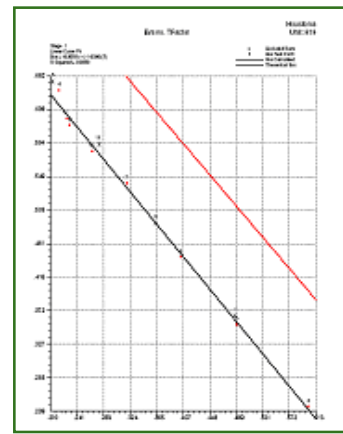
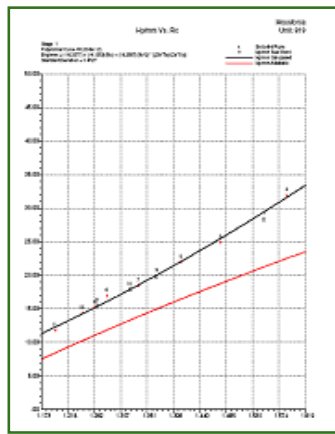
PERFORM is easily activated through the area explorer.



Horsepower and Capacity Curves

The XY plots below provide the analyst with assurance that the data being used to develop the curves is useful and proves that the operating range is completely mapped.

This performance test data is converted into the coefficients that allow PERFORM to create accurate compressor curves. These coefficients are also used in control systems for automated control of load and flow.



Engine Data Reduction Report

The data below are calculations from the empirical data, producing the points for the XY plots.

Engine 819 Data Reduction
Houstonia Station

819	End	Step	Cl	Pa	Pd	Ta	Td	k	Im_EFF	IHP	HP/984	Q	Err
1.0	1.8	1.2	1.259	494.2	650.8	43.0	89.7	1.332	72.4	2017.0	15.92	19.288	-5.84
1.0	1.2	1.2	1.259	494.2	650.8	43.0	89.7	1.332	72.4	2199.0	15.92	18.835	-5.7
1.0	2.8	1.2	1.259	494.2	650.8	43.0	89.7	1.332	72.4	2095.0	15.92	19.182	-6.04
1.0	3.8	1.2	1.259	494.2	650.8	43.0	89.7	1.332	72.4	2175.1	15.92	23.842	-7.11
1.0	4.8	1.2	1.259	494.2	650.8	43.0	89.7	1.332	72.4	2263.4	15.92	17.892	-5.7
1.0	5.8	1.2	1.179	508.9	673.5	43.0	89.7	1.332	72.4	1813.0	17.90	114.145	-5.9

Engine Verification Report

The verification is done immediately following the testing and provides the analyst and the operational personnel with the accuracy of the curves throughout the operating range.

Engine 819 Verification
Houstonia Station

819 March 17, 2006 17:07:10

Rn	#	St	Ld	Comp	Isent	Capacity	Test	Diff	IHP/984	Test	Diff	Horsepower	Eqtn	Diff	
1	1	13	1.55	73.5	77.04	2.1	28.54	-3.8	2000.4	2032.6	-1.6				
5	1	10	1.27	70.5	135.46	3.4	15.52	.7	1858.6	1783.4	4.0				
9	1	15	1.37	73.1	59.55	.0	19.96	-.0	1583.0	1596.4	-.8				
10	1	12	1.32	72.4	114.14	2.4	17.98	-.2	1817.0	1775.9	2.3				
											Mag Ave Diff=	2.0			
												1.4			
												2.2			