



TURBOMACHINERY TRAINING SEMINAR



Flex Live Software

for

"Turbomachinery Performance Analysis"

Remote via. Zoom



Flexware® www.flexwareinc.com

2023

Flex Live Software, Performance Analysis, Data Reduction & Performance Curves

- Fundamentals
- Manual Data Entry
- Continuous Data Streaming
- Data Analysis
- Plotting on OEM Curve
- Trending
- Forecasting

Results		Inlet	Discharge
Specific Volume	0.851	0.233	R ³ /lb
Temperature	44.00	-112.0	°C
Enthalpy	232.1	44.94	Btu/lb
Entropy	2.108	1.662	Btu/lb °R
Sat. Temperature	-78.30	-54.99	°C
Specific Heat (Cp)	0.529	0.929	Btu/mol °R
Compressibility	0.948	1.000	
Molecular Weight	20.39	20.39	
Dynamic Viscosity	0.000008	0.000007	lb-ft sec
Sonic Velocity	1.283	641.9	ft/sec
K (Cp/Cv)	1.225	1.117	
K (Temperature)	1.265	1.217	
K (Volume)	1.247	0.583	
Crit. Pressure	47.53	47.53	kg/cm ² a
Crit. Temperature	-53.74	-53.74	°C
Volume Flow	4.242	1.162	R ³ /min

Section Results	
Mass Flow	4.983 lb/min
Gas Power	-21.993 HP
Work	-44.391 m
Head	-442.7 m
Efficiency	0.997 %

TAKE ADVANTAGE OF THIS EXCELLENT OPPORTUNITY TO LEARN ABOUT FLEX LIVE SOFTWARE AND EASY, PRACTICAL METHODS TO ANALYZE, TREND, FORECAST AND TROUBLESHOOT TURBOMACHINERY PERFORMANCE

"Good Seminar. Improves my analytical knowledge. Will save the company money & time." Sheridan Suleiman, Sarawak Shell

People Who Should Attend This Seminar

The people attending the course should be technical personnel interested in better understanding turbomachinery performance analysis (operators, engineers & technicians, reliability specialists, project engineers, equipment specialists and planning engineers).

"Difficult subject made easy to understand – Excellent work!" Showkath Ali K. C., Qatar Petrochemical Co.

FOR THE SEASONED ENGINEER AS WELL AS THOSE NEW TO THE SUBJECT OF TURBOMACHINERY.

Course Objective

Basic turbomachinery performance analysis and easy, practical methods to assess turbomachinery performance problems. Improving plant production and reducing maintenance costs.

Course Materials: "Compressor Performance", access to training slides and other printed material.

Time Schedule

Seminar duration: 1 days for 4 hours. The seminar will be presented by invitation using Zoom.

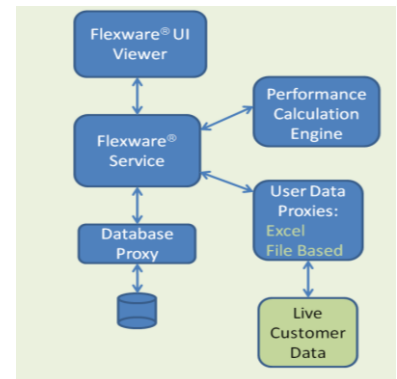
"Notes, book & software are excellent. I still use the notes and text from your course regularly in my work." Hosam Hassan, Praxair, Toronto

Program

Following subject areas are covered over a three-day program. A tentative schedule is shown below.

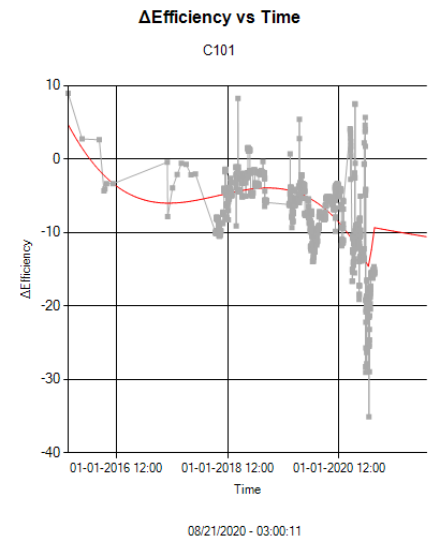
"...All in all the course is excellent with a lot of valuable information being transmitted." Scott Schultz, Chart Energy & Chemicals, The Woodlands, Texas

- Fundamentals
- Manual Data Entry
- Continuous Data Streaming



- Data Analysis
- Adjusting Curves for New Conditions
- Plotting on OEM Curve
- Trending
- Forecasting

Q & A: Review in detail questions about Flex Live software issues and go over specific questions and problems brought to the training seminar.



"I learned a lot!" Jasmin Tremblay, Ultramar (Valero), St. Romuald, Quebec

"..overall good job." Damien Parson, Occidental Chemical, Geismar, Louisiana

"Nice lecture & content. Helpful to my future work." Frank Yuan, Chart Energy & Chemicals, The Woodlands, Texas

Instructor: Kumar P.

Mr. Kumar is associated with Flexware. Inc as an aerodynamist and software tools coding and development engineer. He is involved with the development of compressor aerothermodynamics tools for centrifugal compressor design, field testing and performance estimations of compressors per PTC codes. He has been involved in the tuning and troubleshooting of loading, surge controls and air/gas audits for performance optimization.

Mr. Kumar is a certified Samsung Techwin Compressors installation and commissioning engineer. Prior to working with Flexware, Mr. Kumar was with ELGI Equipment, India where he was involved in the designing of Industrial Reciprocating Compressors and Screw Compressors. He also formulated & led a team for development of Turbo compressors and established design methodologies meeting API Codes. In the subsequent experience, he is involved with refrigeration compressor subsystems and mechanical design. He led test plans for validation of compressors with new refrigerants and performance improvising programs.

Kumar received his Masters Degree from the National Institute of Technology, India specializing in the Design of Thermal Power Equipment. He attended Texas A&M Short courses on Compressor Aerodynamics and he has conducted hands on training for Engineers.

"Thank you for the heat balance methodology for condensing turbines. I can save some money for Shell." Clay Crook, Sarawak Shell Berhad

Client Listing: AdvanSix, Aramco, Astron Energy, British Petroleum, Chart Energy & Chemicals, ConocoPhillips, Consumer Coop Refineries, Canadian Natural Resources, Dakota Gasification, Dibran Gmbh, ExxonMobil, Foster Wheeler, Full System Engineering, GE Oil & Gas, John Crane, Hess Oil, Kop-Flex, Linde Engineering, Meco, Motiva, Nalco, Occidental Chemical, Orinoco Iron, Petro-Canada, PDVSA, Praxair, Proman, PTT Exploration & Production Co., Qatar Petrochemical Co., RasGas, Sadara Chemical, Shell Chemical, Sherritt Metals, Sinclair Oil, Sincor, SSK Resources, Sunoco, Suncrude Canada, Tata Chemicals, Turboaleaciones, Valero

