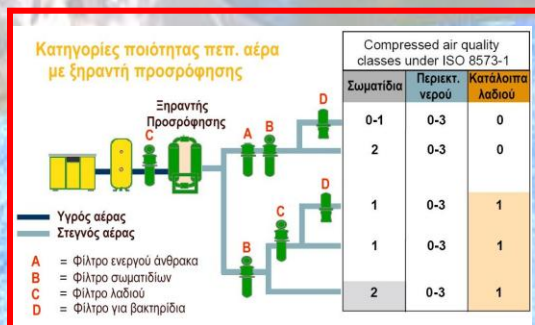
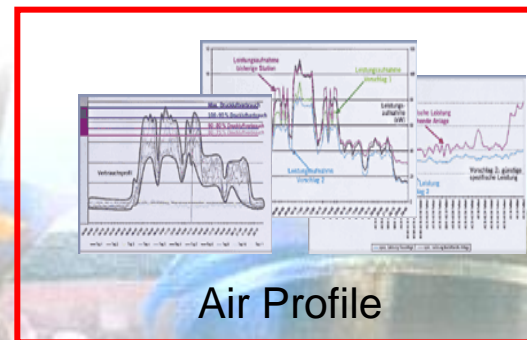
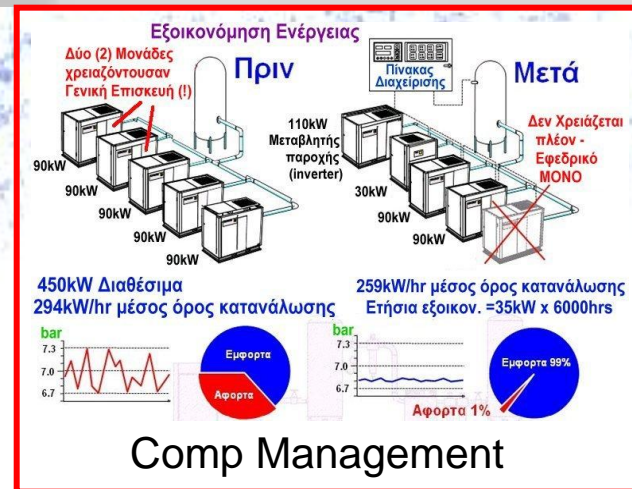




Theo Giamakidis
Compressed Air Specialist

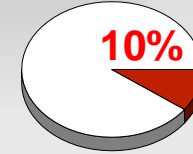
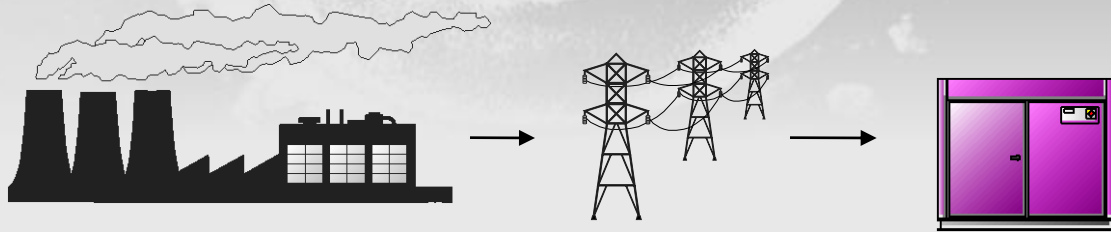


“Modern Management for Efficient Compressed Air Systems”



Industrial Projects – Compressed Air

“in Details – How Important is”



Air Compressors

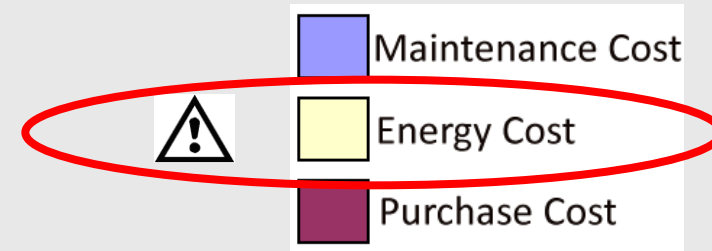
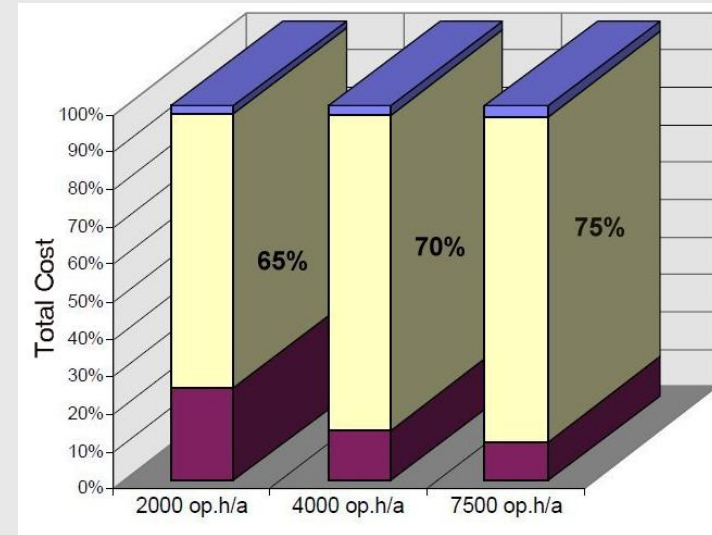


Compressed Air existing at every Productional Enterprise and it is the 2nd important Energy Form after the Electricity.

The Compressed Air System and Compressed Air Plants works many years (maybe 30-40) at the factories.

These Systems have a very low Efficiency index (only 10%) fact which means the need of the optimum management.

Which things must take care someone at the Compressed Air to have a correct decision for the improvement of the Efficiency ?



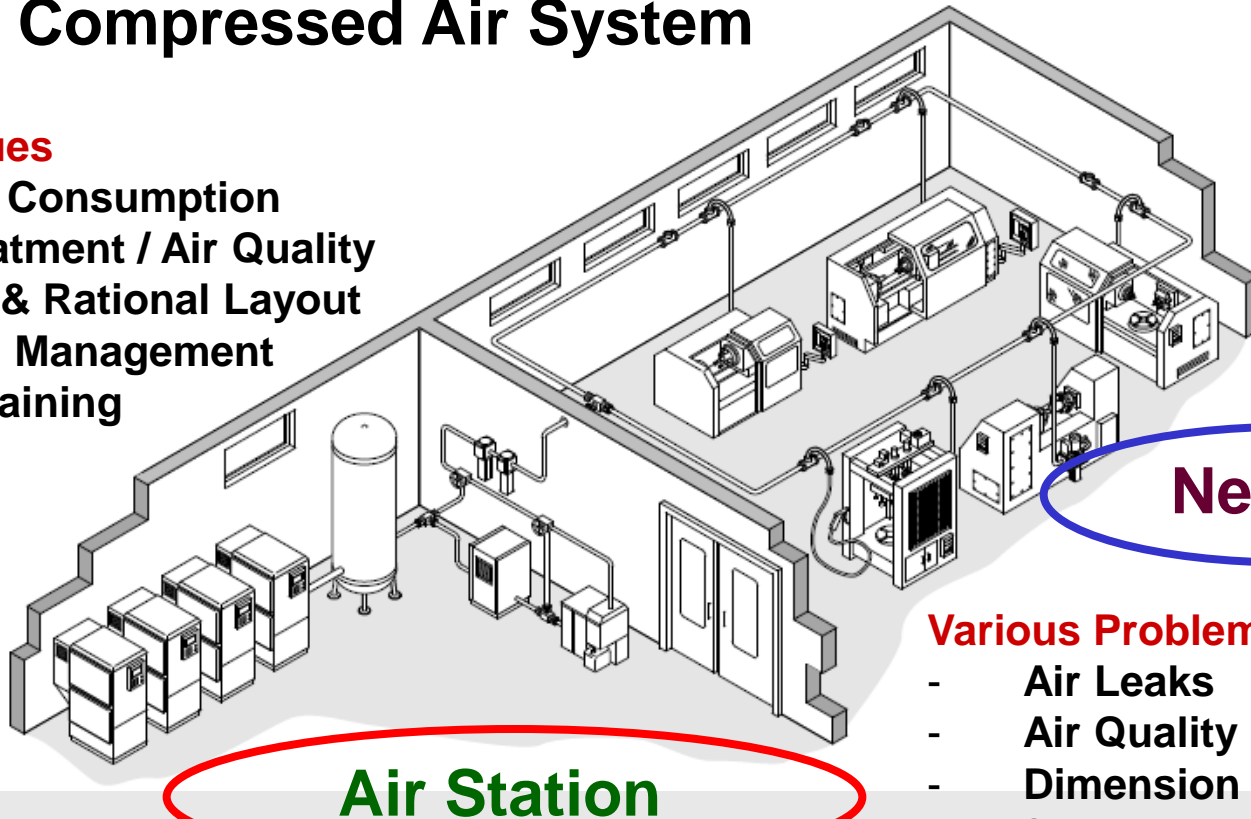


Category / Sections

Compressed Air System

Various Issues

- Energy Consumption
- Air Treatment / Air Quality
- Proper & Rational Layout
- System Management
- User Training



Network

Various Problems

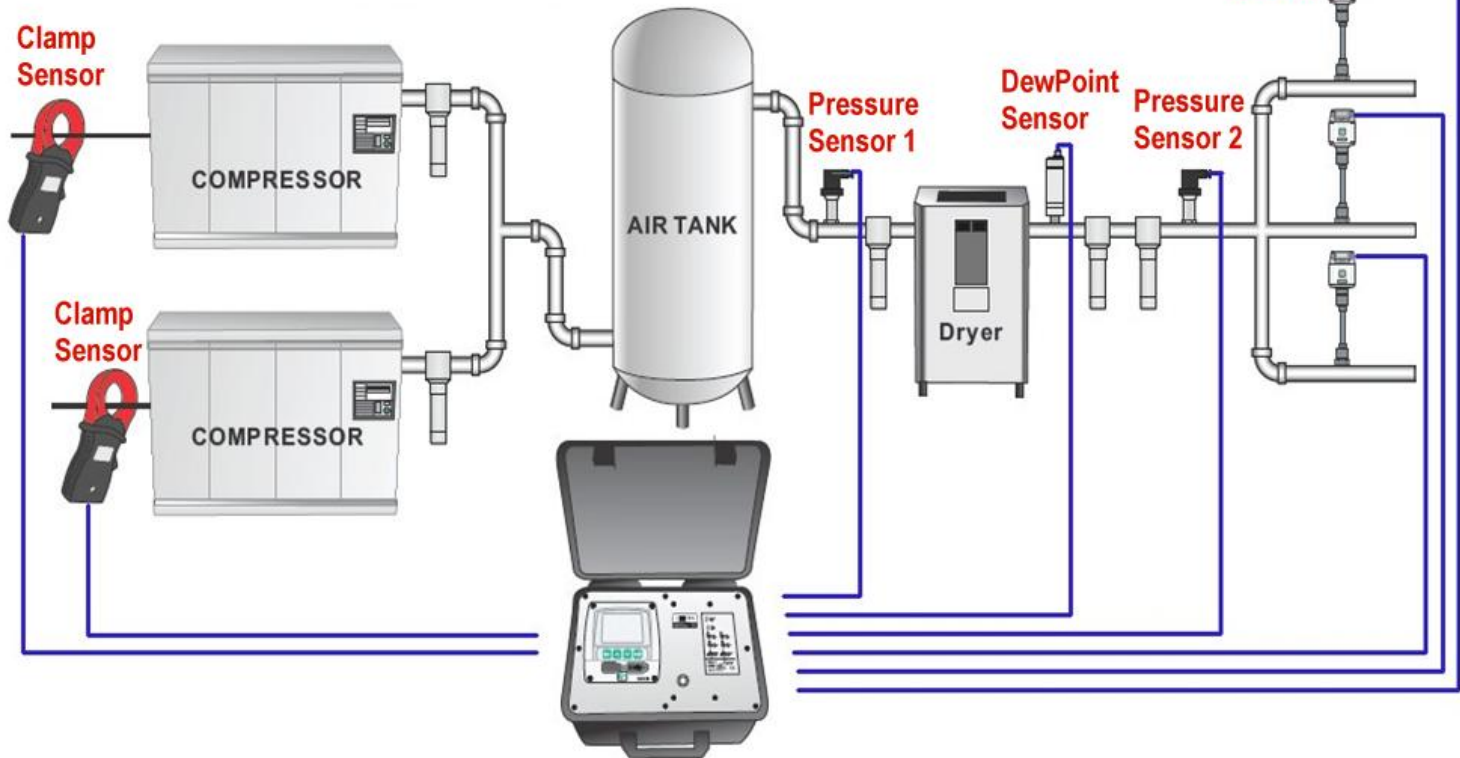
- Air Leaks
- Air Quality
- Dimension of central pipes (Air Velocity)
- User Training

Industrial Projects – Compressed Air

Measurements - Audits



Application



Real Consumption



Air Leaks



Real Power Consumption



Mechanical / Electrical Condition



Air Quality ISO 8753



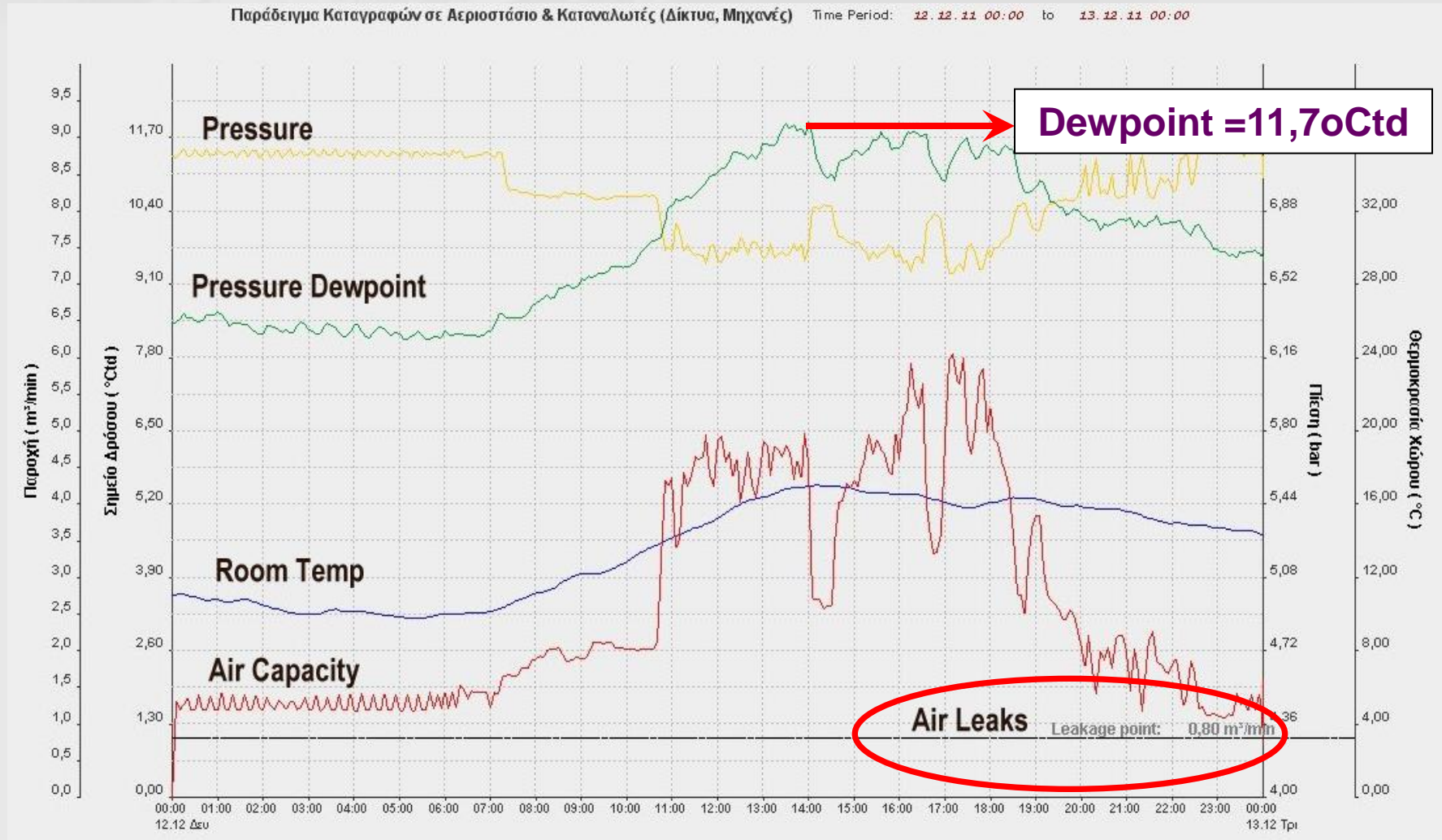


The Power of the Measurement (Audit)





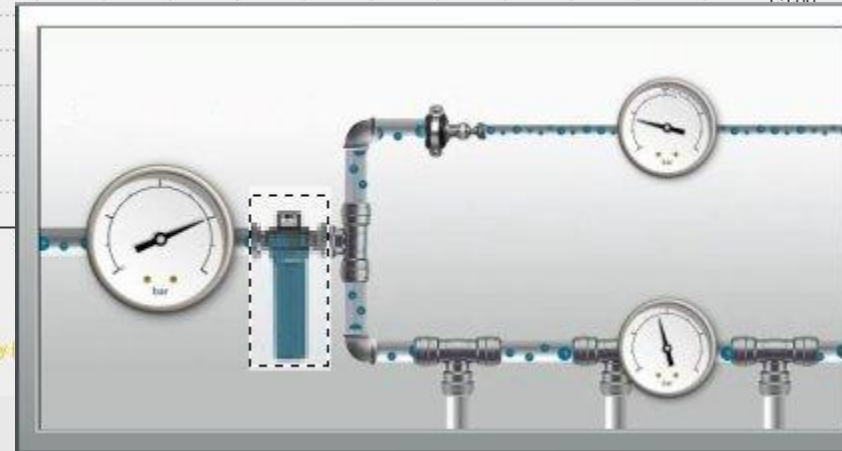
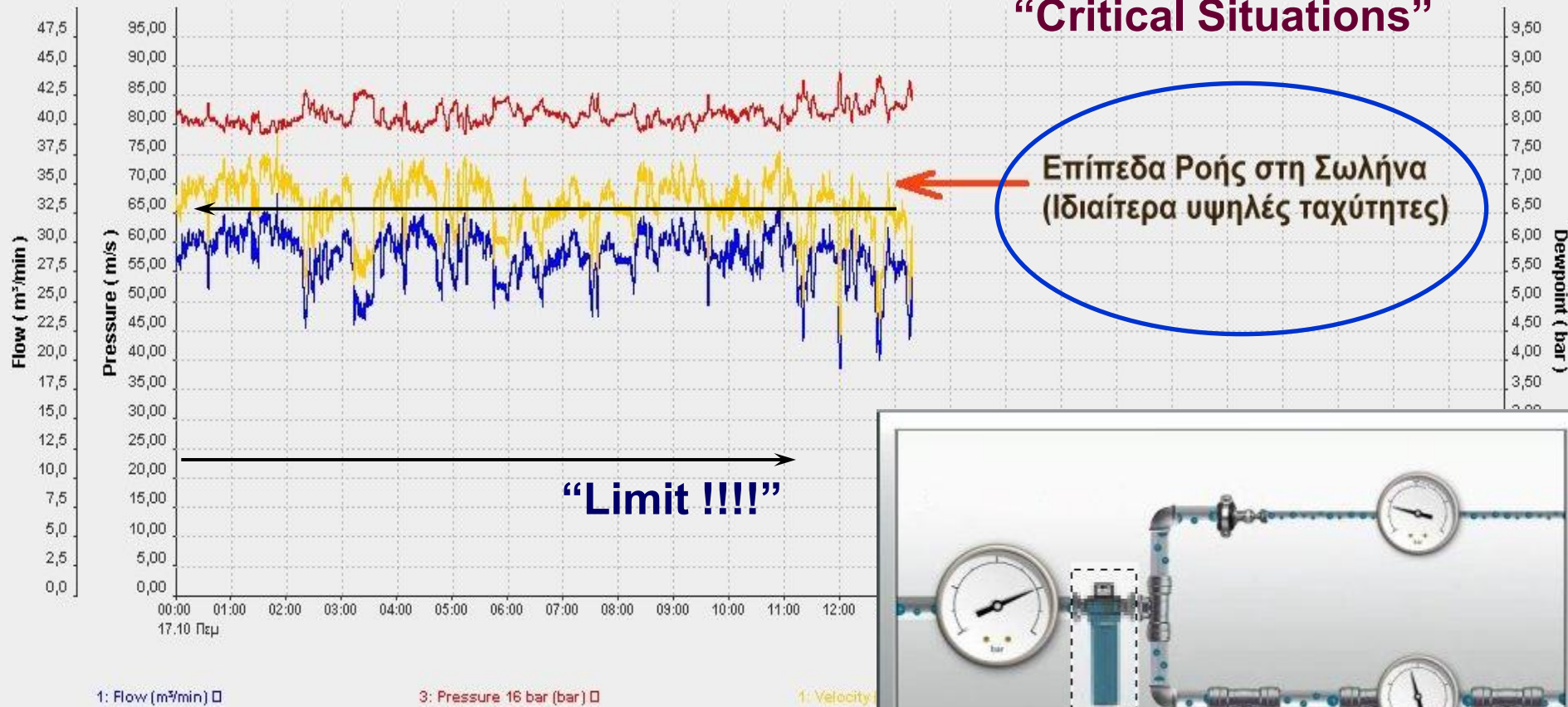
Some Examples from Audits - Measurements





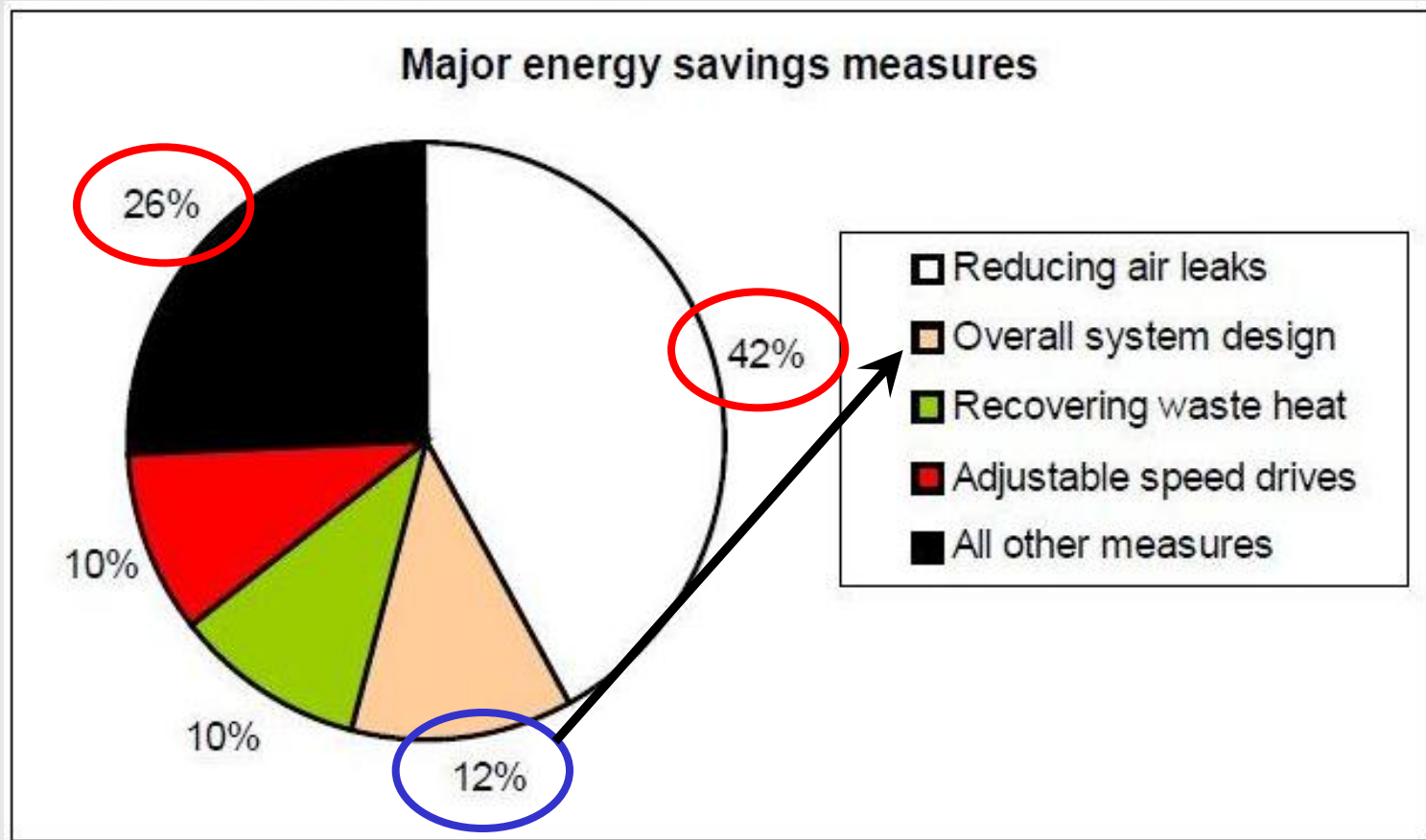
Some Examples from Audits – Air Velocity

17_10_2013 Time Period 17.10.13 00:00 To 18.10.13 00:00





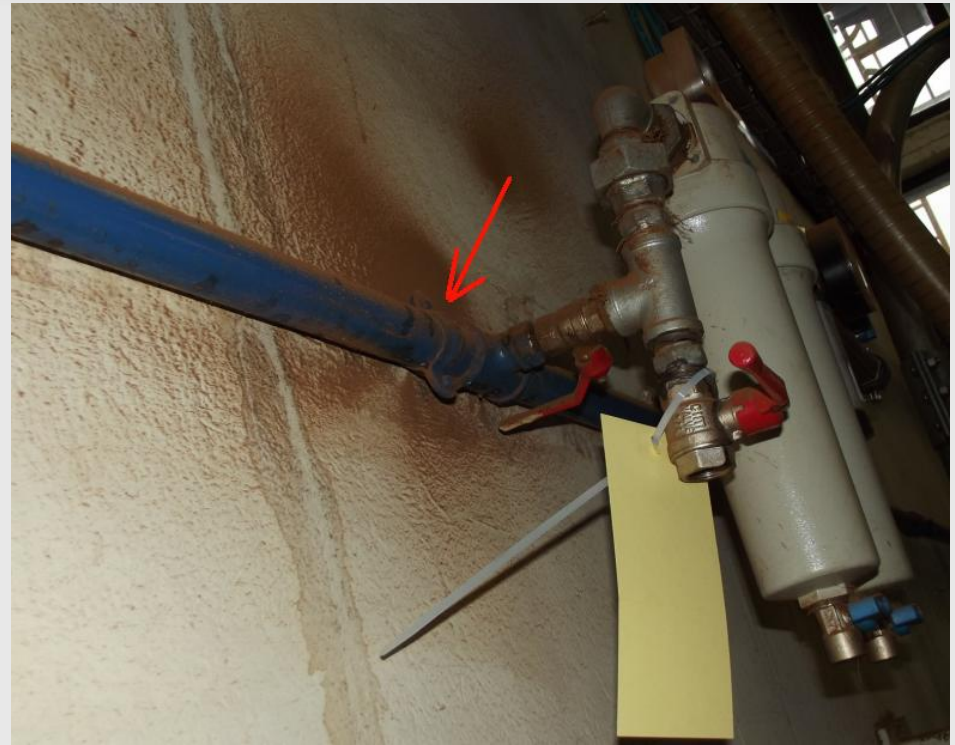
How we will Increase the Efficiency



Overall System Design / Engineering – Why ?



About Air Leaks



Where they are !!



About Air Leaks



Where they are !!

Industrial Projects – Compressed Air

The Cost of Air Leaks



Διαρροή 46db πράγμα που σημαίνει ότι εάν η επιχείρηση λειτουργεί 20h/ημέρα & 320ημ/έτος θα έχει 264Eur σπατάλη μόνο από αυτό το σημείο



Διαρροή 59db πράγμα που σημαίνει ότι εάν η επιχείρηση λειτουργεί 20h/ημέρα & 320ημ/έτος θα έχει 374Eur σπατάλη μόνο από αυτό το σημείο

Industrial Projects – Compressed Air



“A Case Study at a Food Industry”

	Air Leaks Repaired		Argon Leaks Repaired		Helium Leaks Repaired		Hydrogen Leaks Repaired		Cost Avoidance		% complete
	LPM	Cost	LPM	Cost	LPM	Cost	LPM	Cost	Identified	Repaired	
	0,0	€ 0,00	0,0	€ 0,00	0,0	€ 0,00	0,0	€ 0,00	€ 14.175,91	€ 0,00	
Record Number	Group Name	Location Name	Type of Gas	Pressure at Leak	dB Reading	Problem Description			Identified leaks Cost Avoidance	Size of Leak LPM	Energy Avoidance (kWh)
1	Ground Floor		Air	9	45	Μηχανουργείο- Διαρροή σε μειωτήρα			€ 209,69	92,9	3382
2	Ground Floor		Air	9	43	Μηχανουργείο- Διαρροή σε ταχυσύνδεσμο			€ 197,30	87,4	3182
3	Ground Floor		Air	9	52	Συσκευαστική 1-Διαρροή σε κύλινδρο			€ 254,51	112,8	4105
4	Ground Floor		Air	9	47	Συσκευαστική 1-Διαρροή σε κύλινδρο			€ 222,27	98,5	3585
5	Ground Floor		Air	2	48	Συσκευαστική 1-Ταχυσύνδ & σωληνάκι			€ 107,37	47,6	1732
6	Ground Floor		Air	2	44	Συσκευαστική 1 - Ακροφύσιο			€ 90,86	40,3	1465
7	Ground Floor		Air	9	42	Συσκευαστική 1 - Διαρροή σε Block			€ 191,17	84,7	3083
8	Ground Floor		Air	9	55	Συσκευαστική 3 - Πιστόλι αέρος			€ 274,38	121,6	4425
9	Ground Floor		Air	9	66	Συσκευαστική 2 - Drain σε μειωτήρα			€ 350,30	155,3	5650
10	Ground Floor		Air	2	57	Συσκευαστική 3 - Ακροφύσιο			€ 149,30	66,2	2408
11	Ground Floor		Air	9	68	Συσκευαστική 3 - Σύνδεση σε σωληνάκι			€ 364,60	161,6	5881
12	Ground Floor		Air	9	77	No1 - Ταχυσύνδ & σωληνάκι στη λήψη			€ 430,67	190,9	6946
13	Ground Floor		Air	9	62	No1 - Ταχυσύνδεσμ σε ηλεκτροβαλβίδα			€ 322,16	142,8	5196
14	Ground Floor		Air	9	85	No1 - Ακροφύσιο			€ 491,66	217,9	7930
15	Ground Floor		Air	9	68	No2 - Συνδέσεις σε φίλτρα Festo			€ 364,60	161,6	5881
16	Ground Floor		Air	9	62	No2 - Συνδέσεις σε φίλτρα Festo			€ 322,16	142,8	5196

Προσδιορισμός min διαρροών =	6,28	m ³ /min
Προσδιορισμός min ενέργειας =	228.644	kWh
Προσδιορισμός min κόστους =	14.175	Eur

Industrial Projects – Compressed Air



Statistics : Air Leaks at Different Installations

Food Industry – Inofita, consumption 15m³/min – AirLeaks
6m³/min, percent **40%**

Plastic Industry – Inofita, consumption 16m³/min – AirLeaks
8m³/min, percent **50%**

Electric Furnace Industry – Rentis, consumption 50m³/min –
AirLeaks 10m³/min, percent **20%**

Battery Industry – Xanthi, consumption 26m³/min – AirLeaks
7m³/min, percent **27%**

Flavor Miles – Inofita, consumption 15m³/min – AirLeaks
6m³/min, percent **40%**



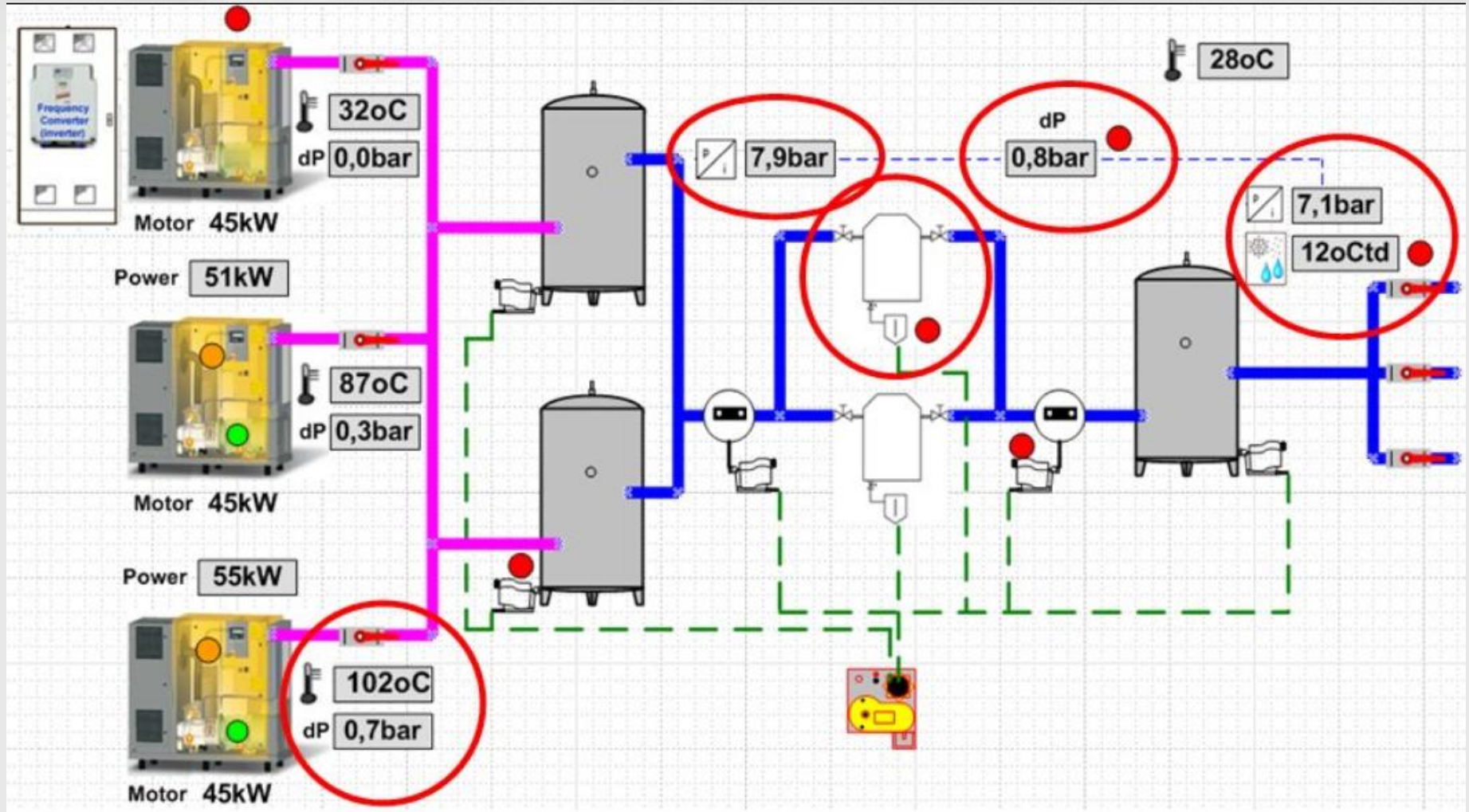
Compressed
Air Systems

Συστήματα
Πεπ Αέρα

Industrial Projects – Compressed Air



Some typical Problem in Compressed Air Systems
Could we know them before ?

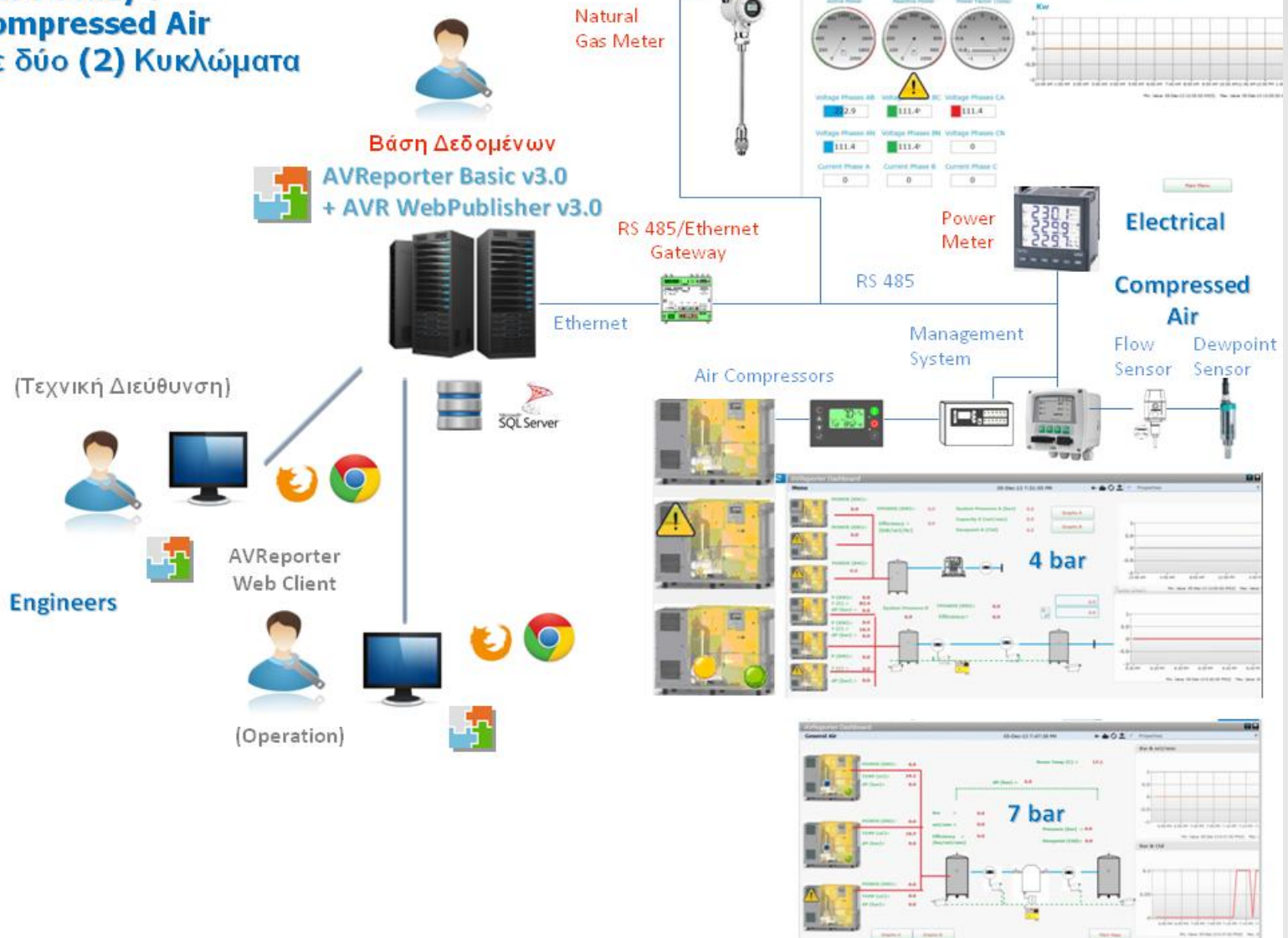


Industrial Projects – Compressed Air

Modern Visualization System - Supervisory



Case Study : Compressed Air σε δύο (2) Κυκλώματα

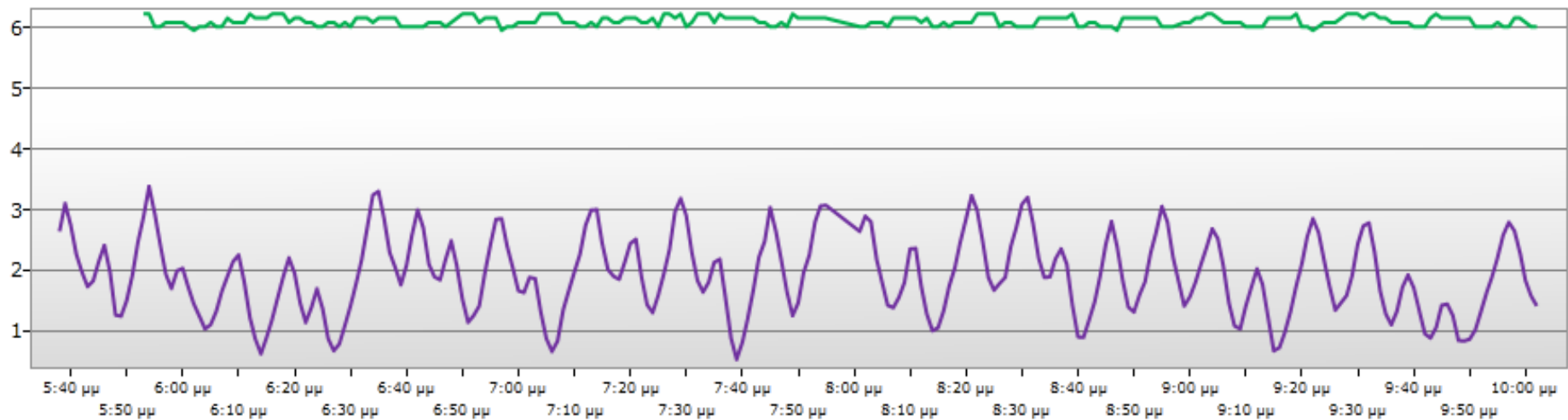


Industrial Projects – Compressed Air



The Power of Measurement

Line Chart



Min. Value 31/3/2014 7:39:00 μμ(0,5) Max. Value 31/3/2014 5:53:00 μμ(6,2)

Table Chart

	Min. Date	Min. Value	Max. Date	Max. Value	Average
BSH.ILC130 - DewPoint GeneralAir()	31/3/2014 7:39:00 μμ	0,5	31/3/2014 5:54:00 μμ	3,35	1,88
BSH.ILC130 - System_Pressure_GeneralAir()	31/3/2014 6:02:00 μμ	5,93	31/3/2014 5:53:00 μμ	6,2	6,08

Industrial Projects – Compressed Air



The Power of Measurement - Reports

KEY PERFORMANCE INDICATOR

Report generated on: Τετάρτη, 2 Απριλίου 2014

Start date: 2/4/2014 5:20:00 μμ

End date: 2/4/2014 6:32:59 μμ

SPECIFIC	MIN	AVERAGE	MAX
TPower_OilFree	57.82 Kw	93.86 Kw	118.01 Kw
Capacity_OilFree	5.45 m3/min	9.93 m3/min	12.98 m3/min
Efficiency_OilFree	7.55 KW/m3/min	9.5 KW/m3/min	13.68 KW/m3/min

PERFORMANCE		TOTAL	
ActiveEnergy_OilFree		98.8 KWH	
Total_Capacity_OilFree		684.88 m3	
ActiveEnergy_GeneralAir		0 KWH	
Total_Capacity_GeneralAir		14.34 m3	
		OPERATIONAL TIME	1.2 Hrs

INPUT	MIN	AVERAGE	MAX
DewPoint_OilFree	-28.04 ctd	-27.59 Ctd	-26.94 Ctd
DewPoint_GeneralAir	-0.15 Ctd	0.84 Ctd	2.85 Ctd
Temperature	21.07 C	21.34 C	21.36 C

Industrial Projects – Compressed Air



Conclusion – For more Efficient Compressed Air

Compressed air costs money



Air audits can
save **£000's**
consult your Charter Holder !

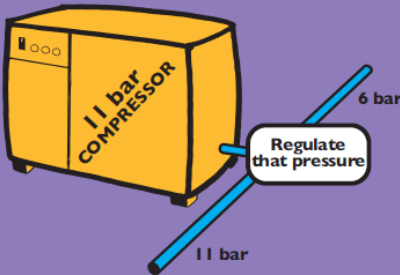
and save energy!



Change
blocked filter elements!



Control!
your compressors!



Regulate that pressure!



service that compressor!

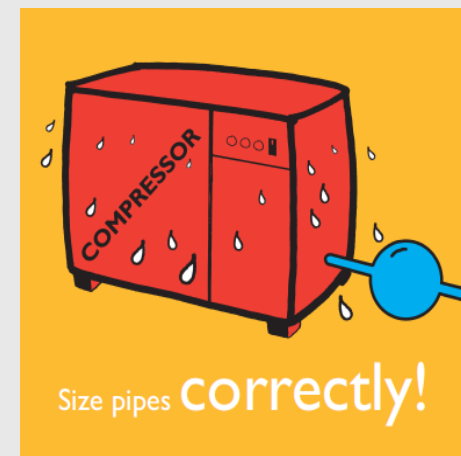


Use that heat !

Industrial Projects – Compressed Air



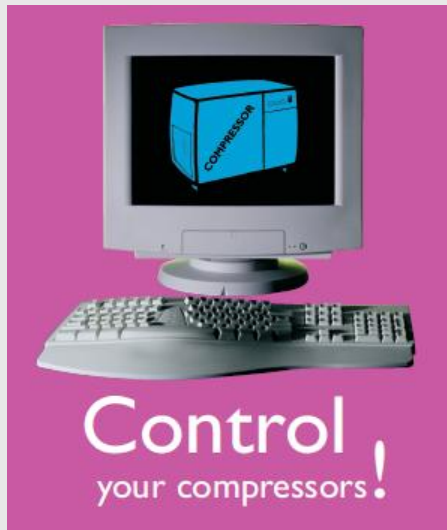
Conclusion – For more Efficient Compressed Air



Industrial Projects – Compressed Air



Conclusion – Audits and Instrumentation is the only Engineering Tool for a success and prove Energy Saving or Efficiency Increase



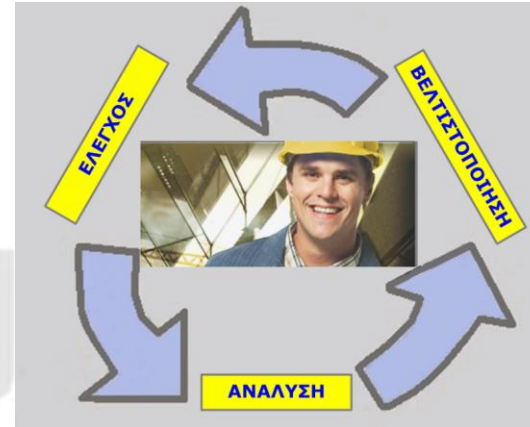
Results based on Measurements and Diagrams !!





Green Air Energy
efficient compressed air

<http://www.greenaireenergy.eu>



**Compressed
Air Systems**

**Συστήματα
Πεπ Αέρα**

Thank you for your attention !

Theo Giamakidis

Mobile: +30 6976400346 – e-mail: technical@greenaireenergy.eu

