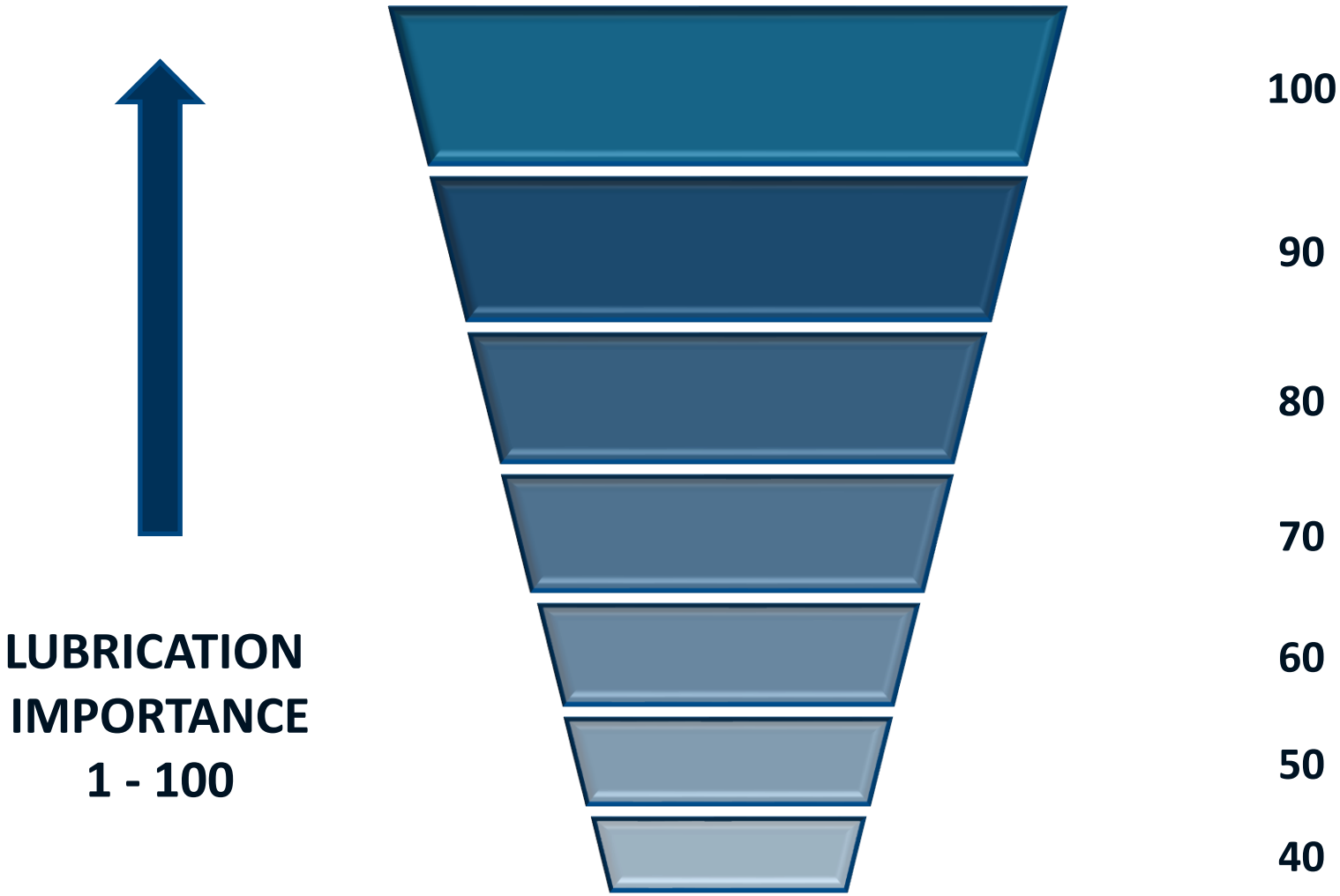
BRCE
BEARING RELIABILITY CONFERENCE & EXPO

Taking the CMMS out of lubrication

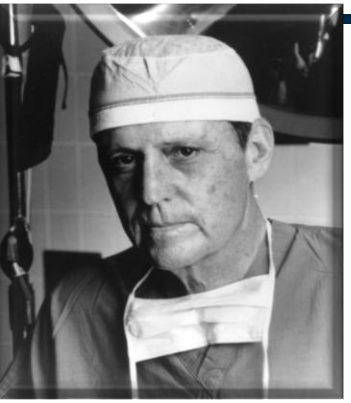
HEAR SDT MORE Ultrasound Solutions

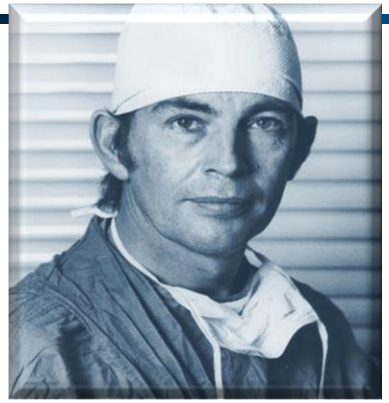

LUBRICATION
IMPORTANCE
1 - 100
100
90
80
70
60
50
40

Anyone dreams that his son becomes a grease guy ?

- We often respect oncologists and surgeons much more then a guy who is running a „stop smoking” program in primary medicine

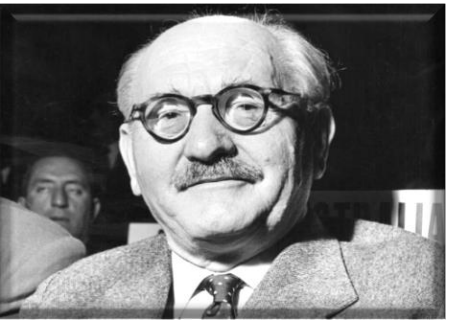
- Often, we do that in industry as well
- Lube teams are usual victims





People who repair damage. People who wake up 3 o´clock in the morning to urgently save the machine are heroes, famous… celebrated

Some CM boys and girls … sometimes known, mostly in the shadow. Often save more lifes than surgeons, find things in time, stop progression, collateral damage

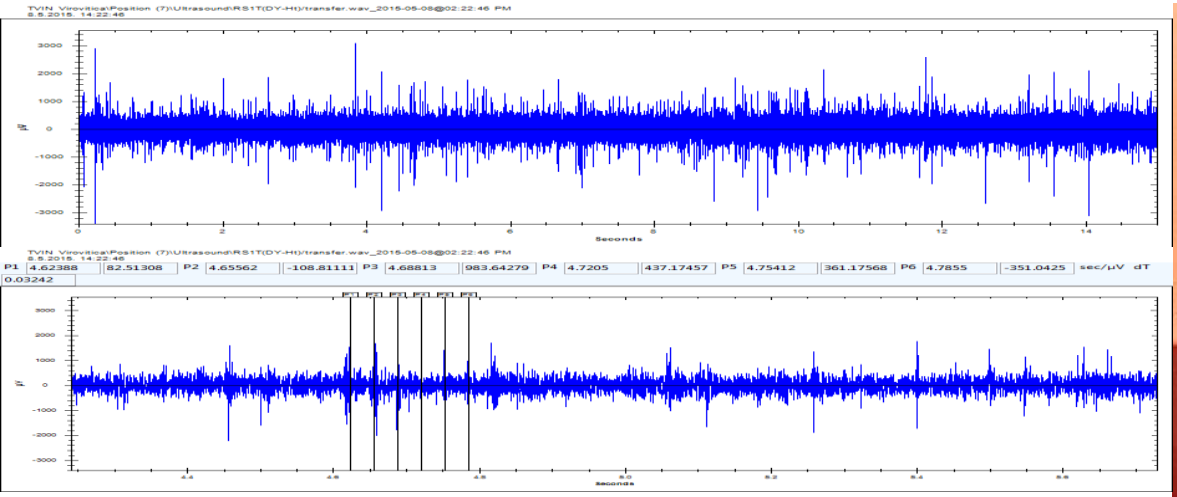


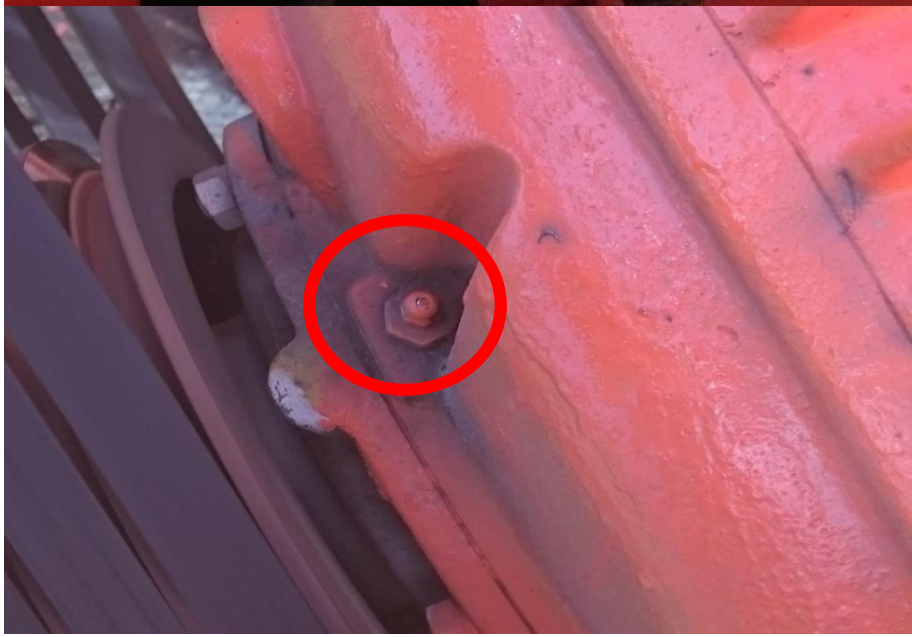
Primary medicine; hygiene ? Our grease guy. Never heard of him, no fame and glory. Still, all starts right there. But no glory about that.

What are we up against ?

Welcome to industry 4.0 !

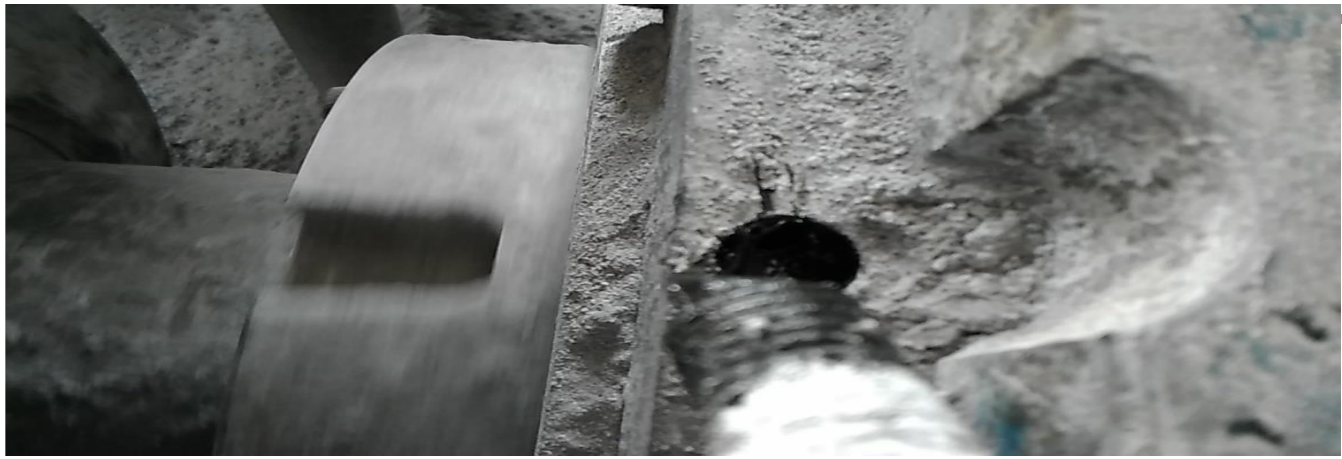

SCARPA





Both bearings were supposed to be lubricated.
„They were both greased last week”

Painted a year ago !



Instead of grease fitting, there is a bolt. It is clearly visible that there is a pile of dust covering the bolt. Once unscrewed, nothing stops dust to contaminate the grease

Time based lubrication

$$T = K \times \left[\left(\frac{14{,}000{,}000}{n \times (d^{0.5})} \right) - 4 \times d \right]$$

Where:

T = Time until next relubri

K = Product of all correcti
Ft x Fc x Fm x Fv x F
(see table)

n = Speed (RPM)

d = Bore diameter (mm)

Note:
ips = inches / second
0.2 inches / second = 5 mm / sec.

Grease Interval Correction Factors

Condition	Average Operating Range	Correction Factor
	w 150°F	1.0
	75°F	0.5
	00°F	0.2
	00°F	0.1
	asive dust	1.0
	rasive dust	0.7
	ive dust	0.4
	sive dust	0.2
	below 80%	1.0
	80 and 90%	0.7
	ndensation	0.4
	r on housing	0.1
	velocity, peak	1.0
	4 ips	0.6
	ee note)	0.3
	centerline	1.0
	centerline	0.5
	nterline	0.3
Bearing Design Fd	Ball bearings	10
	Cylindrical and needle roller bearings	5.0
	Tapered and spherical roller bearings	1.0

Time based lubrication

- Leaves many doubts and introduces huge margin for errors
- It is often a guess

- At the end, it is about friction
- Ultrasound is ***FIT***, where ***F*** comes from friction, we can measure it

- Time based often leads to „not my problem” attitude
- Often taken as „sweet lullaby”

- Once the job is done … **where is the evidence** ?

Time based lubrication

- CM teams close one eye and give blessing for top issue to be done time based
- Lube teams are very often far away from CM in org. structure
- Lube team´s time and work underutilized
- Lube team becomes passive
- Far too much information, knowledge and benefit is wasted


Maintenance of the bearings with grease quantity regulator
Anti friction bearing , 6318.C3
every 3068 operating hours
add 32,7 g of grease.
Renew grease after 20.000 operating hours, but at the latest after 3 years
8.8
JH

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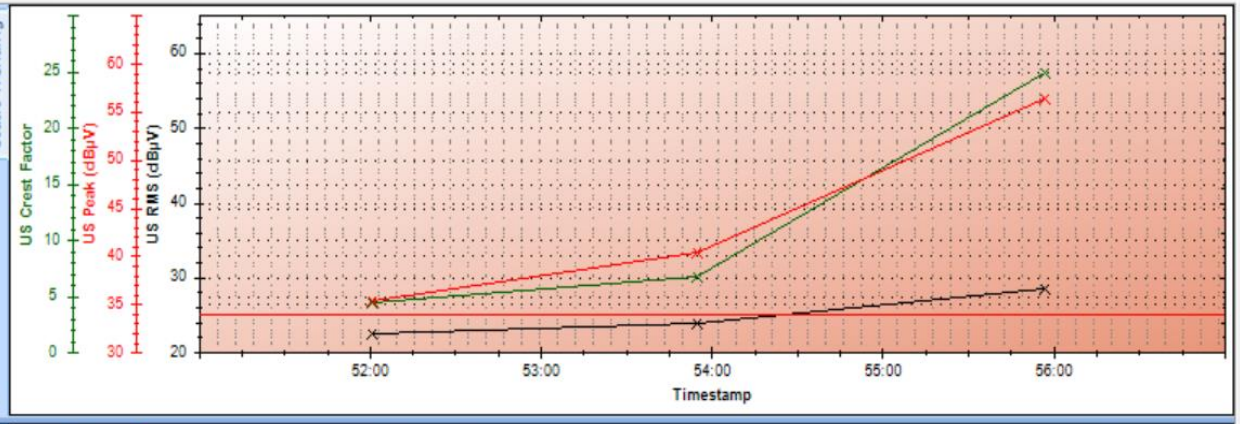
File View Tree Nodes Reports Utilities Options Device Help

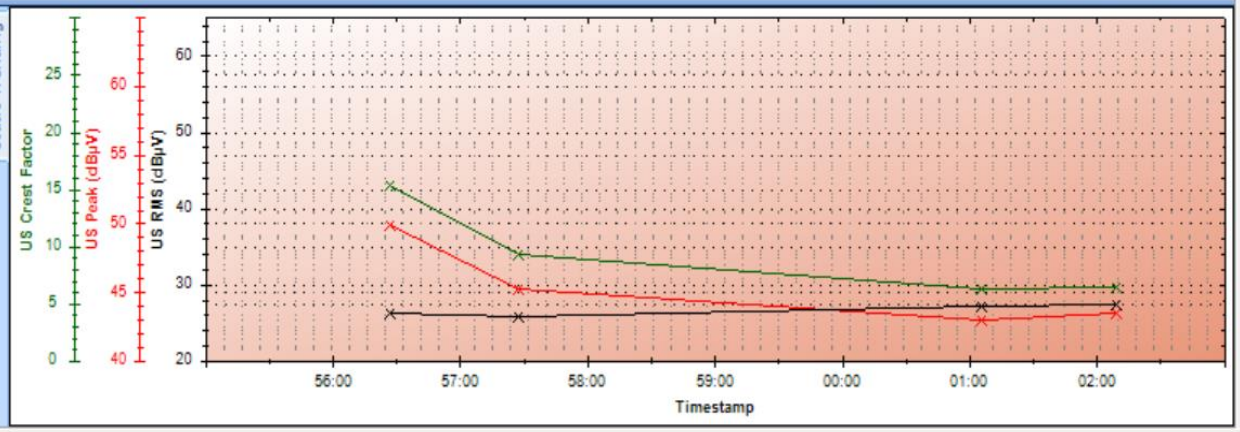
Tree SDT270 SDT170

- 10-P-6003A
- 10-P-6003B
- Steam Trap Battery
- Electrical Panel
- 10-P-6003C
- 73-P-101
- 75-P-101
- 40-V-11001
  - motor
  - coupling
  - fan
    - DE LG
      - RS1T(DY-Ht)
      - RS1T(ST-Ht)
      - TEMP2
    - NDE LG
      - RS1T(DY-Ht)
      - RS1T(ST-Ht)
      - TEMP2
- 40-V-1601
- 73-F-101
- 71-P-103
- 10-C-3001
- C-9002
- LUBRICATION
- FREE MODE
- FREE MODE (1)

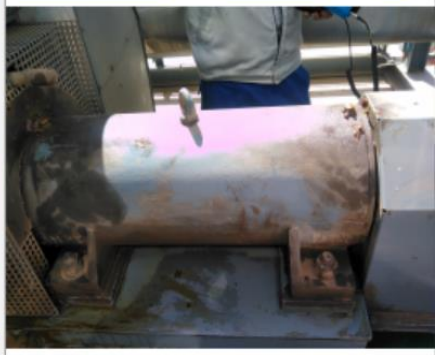
Static Trending



Static Trending



training data base >> 40-V-11001 >> fan



Go to parent [40-V-11001]

Selected 6

0

0

Selection

Filter

Parameters

Measurements Alarms Events

- training data base/40-V-11001/fan/DE LG/RS1T(DY-Ht)
- training data base/40-V-11001/fan/DE LG/RS1T(ST-Ht)
- training data base/40-V-11001/fan/DE LG/TEMP2
- training data base/40-V-11001/fan/NDE LG/RS1T(DY-Ht)

Static Trending Static Trending

Database server: :localhost petak 28 srpnja 2017 21:34 NUM

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File View Tree Nodes Reports Utilities Options Device Help

Tree SDT270 SDT170

- 10-P-6003A
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    - NDE LG
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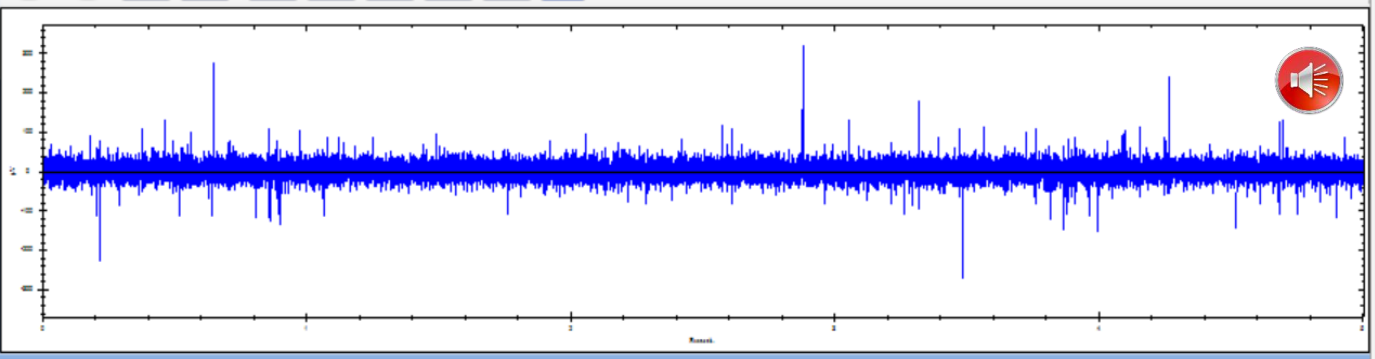
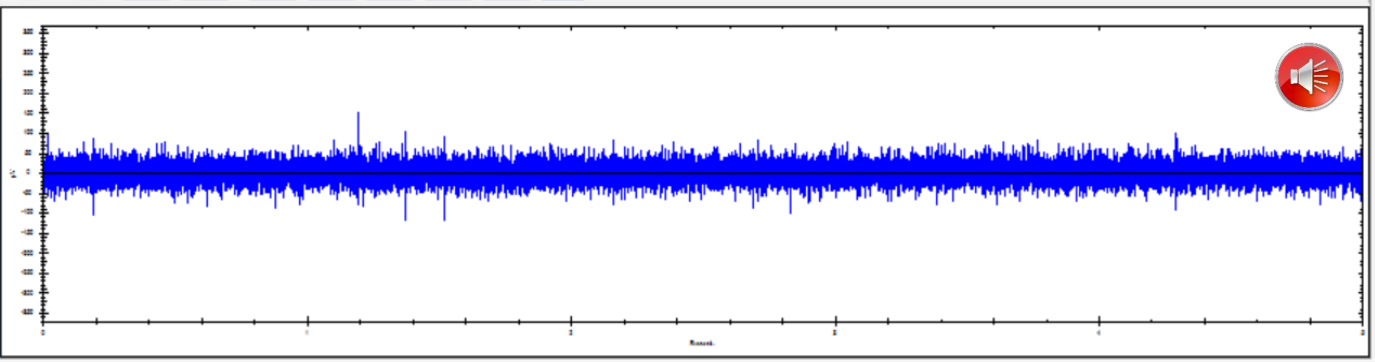
Time Domain



Time Domain



training data base >>
40-V-11001 >> fan

Go to parent [40-V-11001]

Selected 6

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0

Selection

Filter
Parameters

Measurements Alarms Events

- training data base/40-V-11001/fan/DE LG/RS1T(DY-Ht)
- training data base/40-V-11001/fan/DE LG/RS1T(ST-Ht)
- training data base/40-V-11001/fan/DE LG/TEMP2
- training data base/40-V-11001/fan/NDE LG/RS1T(DY-Ht)

Time Domain Time Domain

Database server: : localhost petak 28 srpnja 2017 21:43 NUM

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File View Tree Nodes Reports Utilities Options Device Help

Tree SDT270 SDT170

- 10-P-6003A
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- Steam Trap Battery
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- 10-P-6003C
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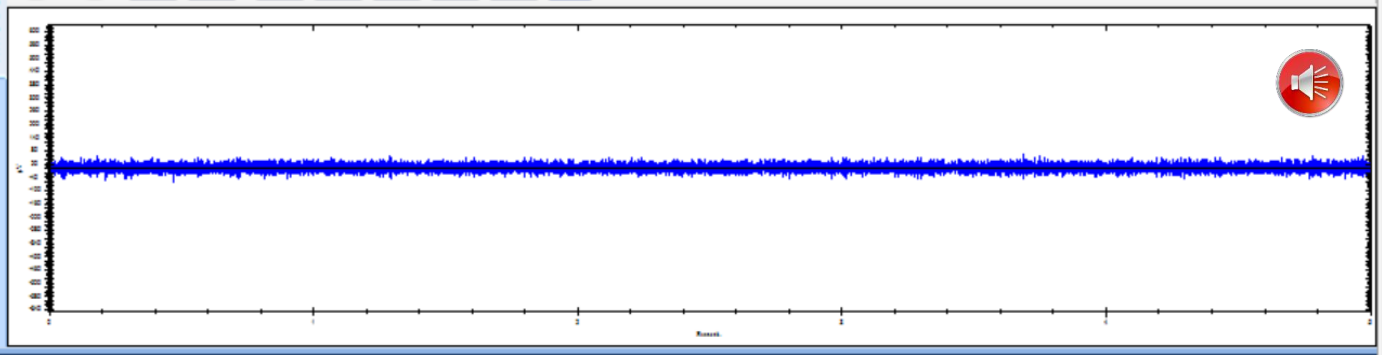
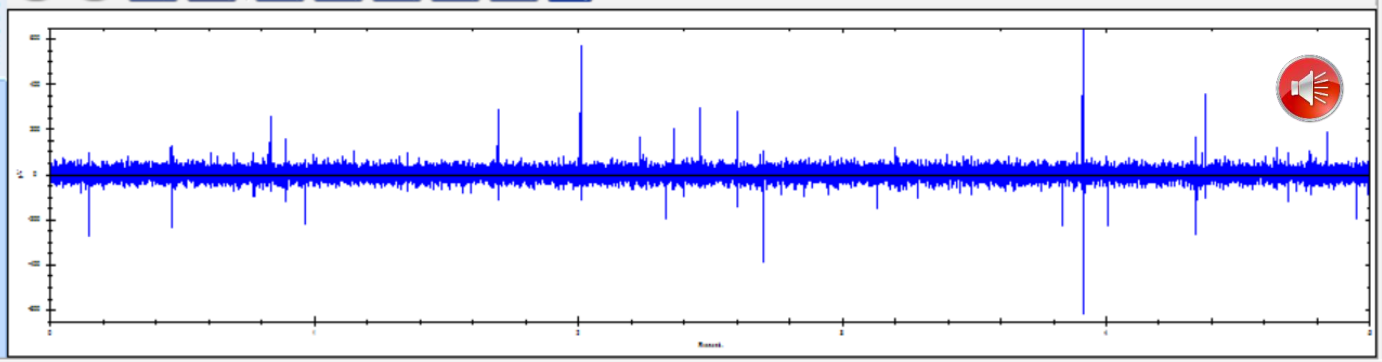
      - RS1T(DY-Ht)
      - RS1T(ST-Ht)
      - TEMP2
    - NDE LG
      - RS1T(DY-Ht)
      - RS1T(ST-Ht)
      - TEMP2
- 40-V-1601
- 73-F-101
- 71-P-103
- 10-C-3001
- C-9002
- LUBRICATION
- FREE MODE
- FREE MODE (1)

Time Domain



Time Domain



training data base >>
40-V-11001 >> fan

Go to parent [40-V-11001]

Selected 6

0
0
1

Selection

Filter
Parameters

Measurements Alarms Events

training data base/40-V-11001/fan/DE LG/RS1T(DY-Ht)
training data base/40-V-11001/fan/DE LG/RS1T(ST-Ht)
training data base/40-V-11001/fan/DE LG/TEMP2
training data base/40-V-11001/fan/NDE LG/RS1T(DY-Ht)

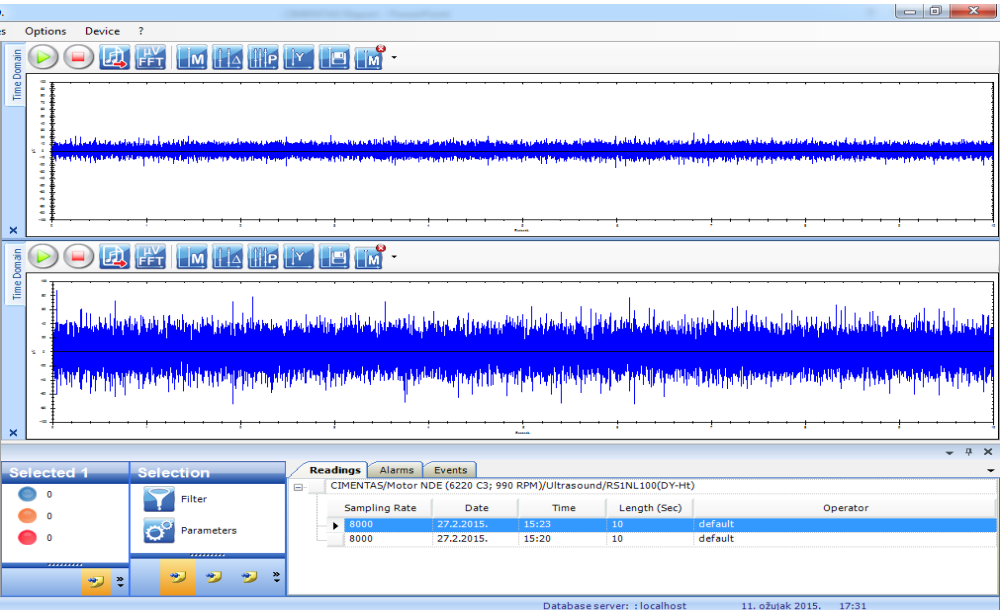
Time Domain Time Domain

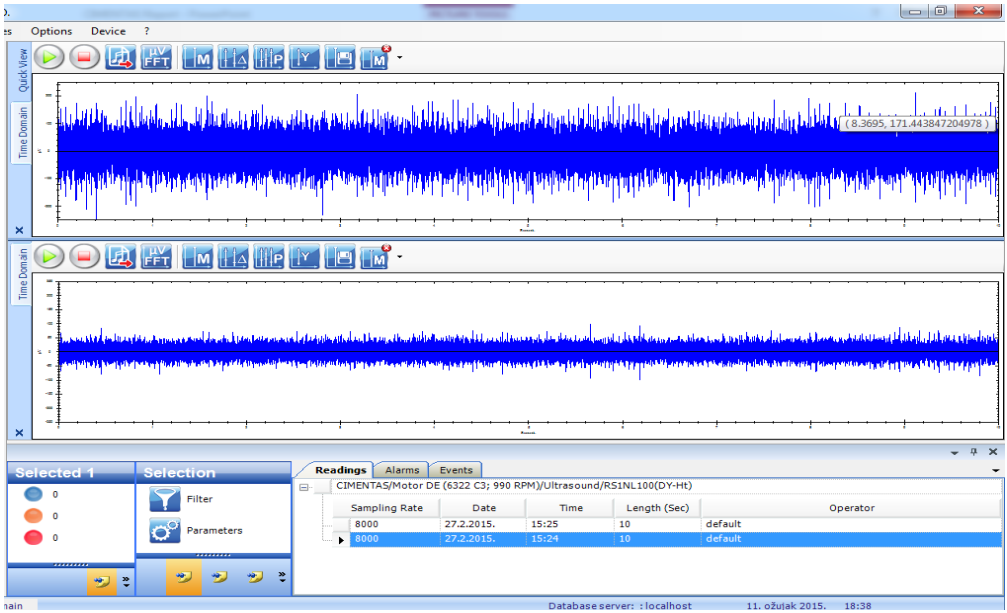
Database server: : localhost petak 28 srpnja 2017 21:48 NUM

Time based lubrication

Or this

Identical machines





Motor 1 DE bearing

Motor 2, DE bearing

Time based lubrication

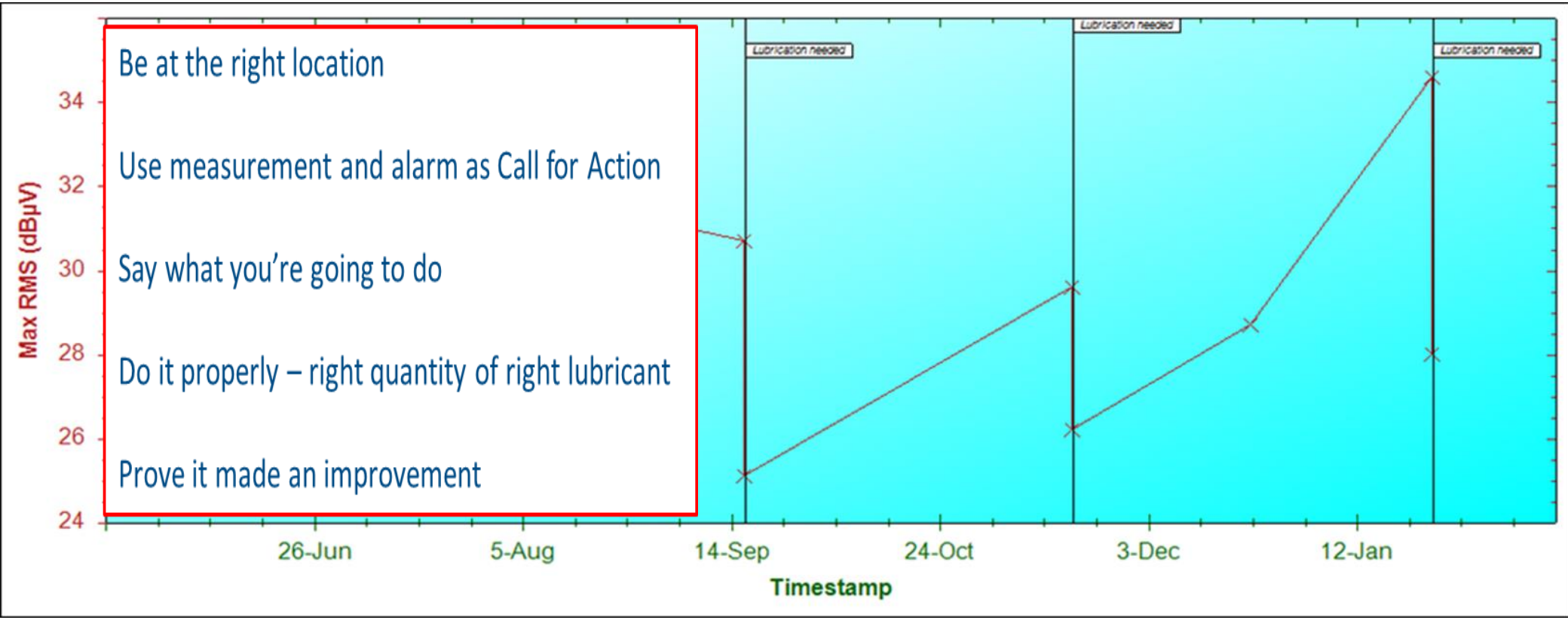
- Target ; reduce friction
- In mentioned cases; target missed
- Still; all  done
- Unfortunatelly,  doesn´t buy me any Reliability

Condition based lubrication

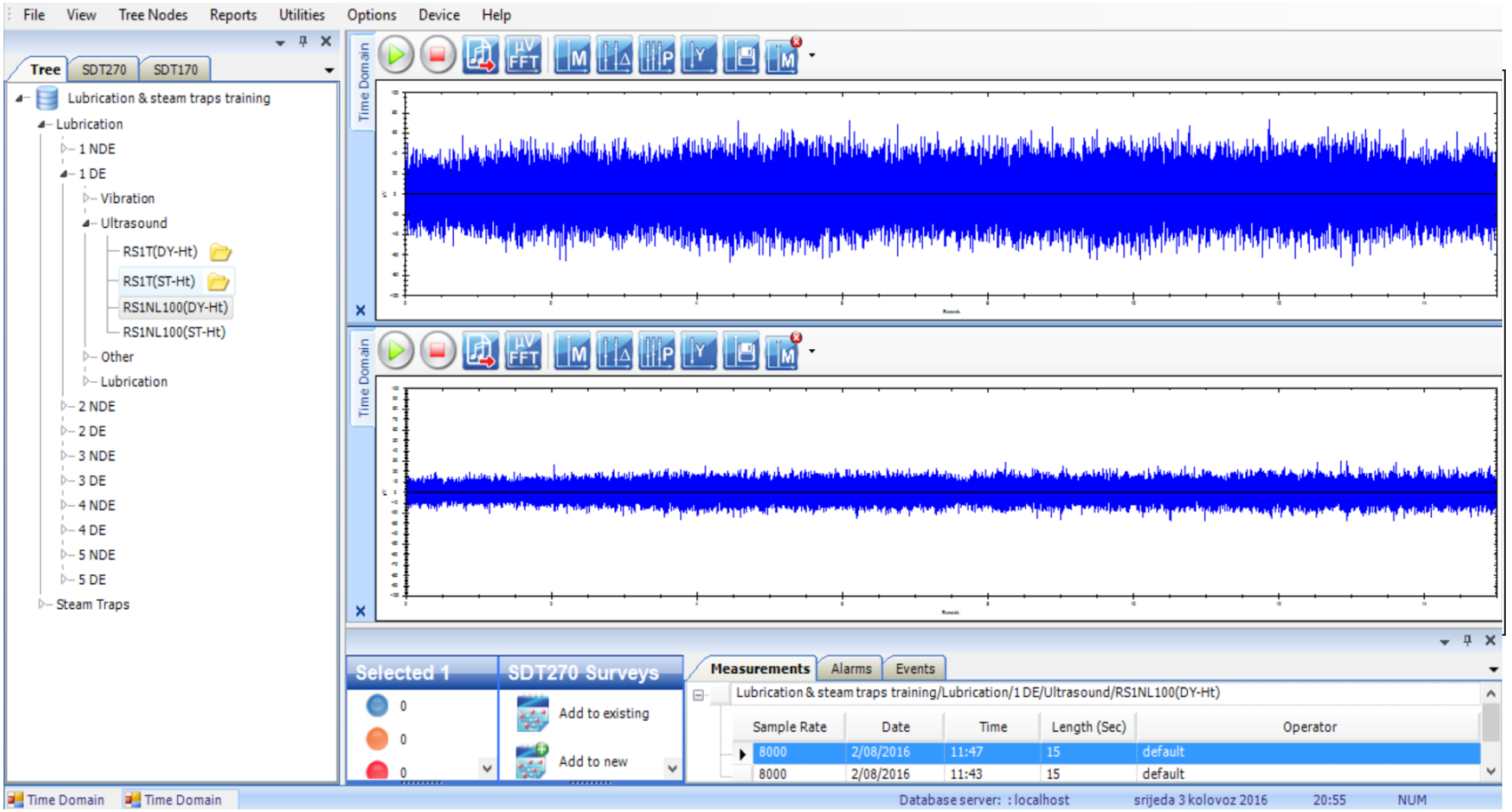
- Target ; reduce friction
- I will keep 

to do my **measurements**
- I can keep the  once I have a **proof**

Condition based lubrication

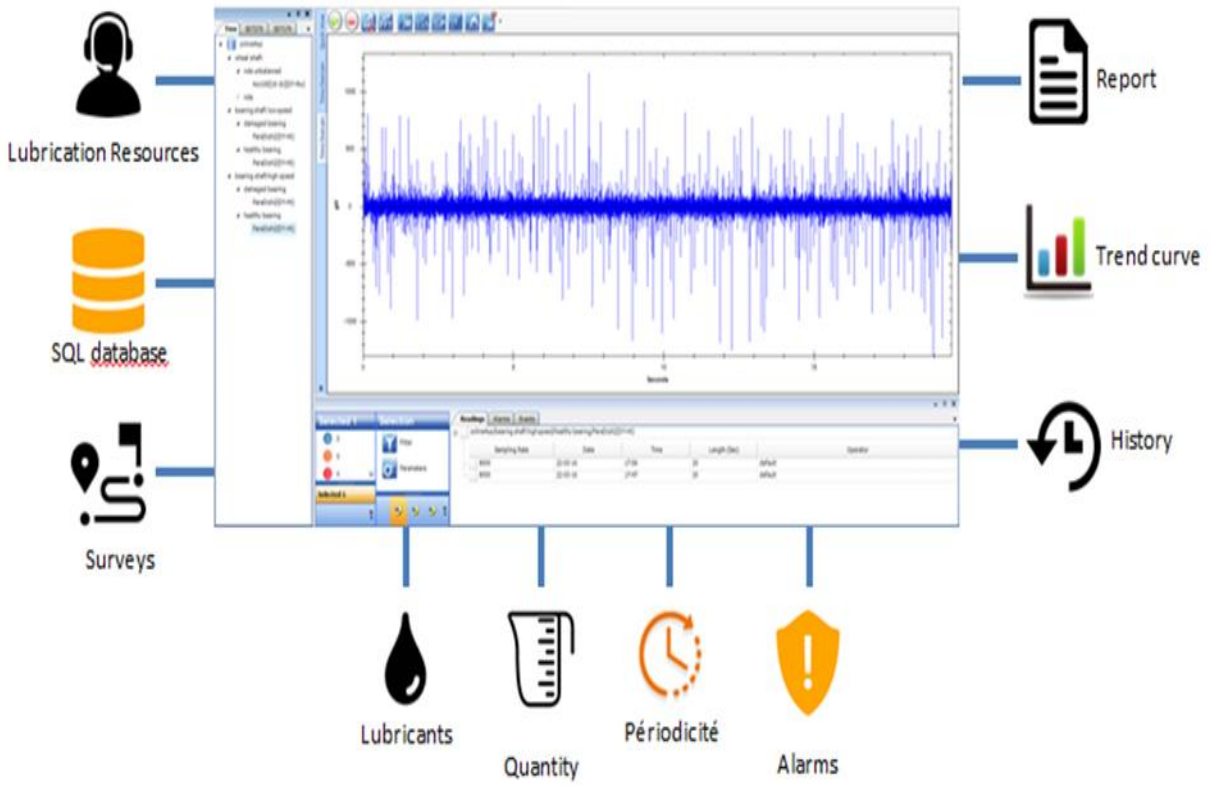


Condition based lubrication



Modern Ultrasound Lubrication Solutions

- Right Lubricant
- Right Lubrication location
- Right periodicity
- Right quantity
- Right lubrication-related alarms



Modern Ultrasound Lubrication Solutions

- Database that contains all assets with all accompanied information
- Measurements and lubrication parameters settings within database
- Routes for the lube team
- Integrated algorithms for data processing and evaluating
- Complete onboard guidance for the operator
- Lube alarms describing response of the bearing to lubrication process
- Alarms based on trending, describing overall condition
- Reporting on grease consumption

- Transforming route from passive to active

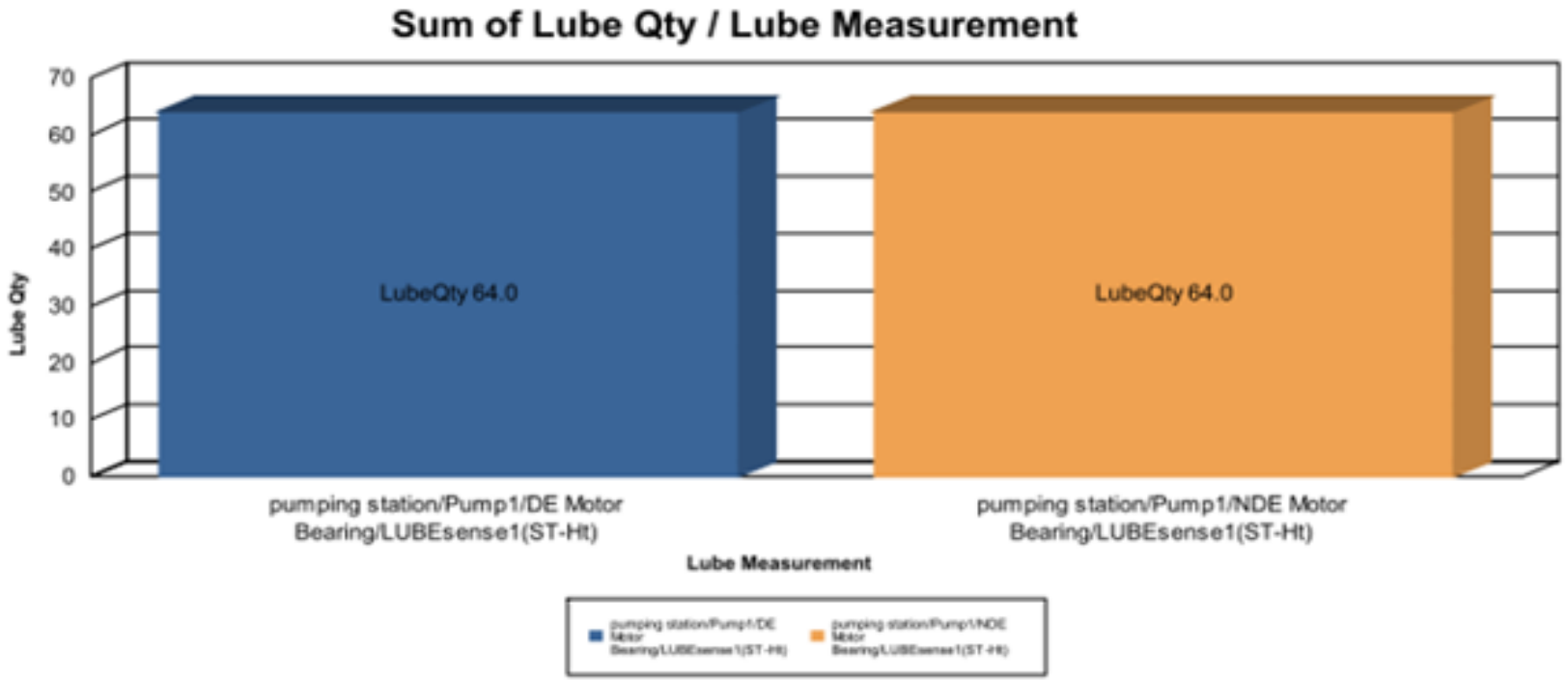
Modern Ultrasound Lubrication Solutions

SDT International

Lube consumption comparison

Tree structure name: pumping station

Report Date : 19-02-17



Modern Ultrasound Lubrication Solutions

- „Grease guy” now becomes first line of defense in CM

- Lube team collects data daily
- Hundereds of valid measurements; FREE OF CHARGE

- Transformation that leads to increased Reliability and decresed cost