Mohammed Abdulaziz
PhD, MSc, BSc, LSSBB
CTO - SIMTRAN
Adj. Professor
University of applied science Bad Sooden-Allendorf
Germany

Autonomous Unmanned Aerial Vehicles for Pump Station Predictive Maintenance Works
Introduction

- **Reactive**: Fix when the equipment is down
- **Periodic**: Scheduled maintenance
- **Proactive**: Eliminate defects at an early stage
- **Predictive**: Use analytics to predict machine failures
Introduction

- Reduces equipment costs
- Reduces repair costs
- Increases safety
- Increases revenue
- Reduces lost production time
- Increases employee time

The benefits of predictive maintenance
Introduction

You should be routinely monitoring:

1. Bearing & lubricant condition
2. Shaft seal condition
3. Overall pump vibration
4. Pump discharge pressure
Introduction

**Bearing and lubricant condition**

Monitor bearing temperatures, lubricant level and vibration. The lubricant should be clear with no signs of frothing. Excessive vibration and an increase in bearing temperature may indicate imminent failure.
Drones as an industry 4.0 maintenance solution

- Drone equipped with remote sensing unit
- X-47B UCAS-D semi-autonomous
- NASA autonomous navigated mars rover
Drones as an industry 4.0 maintenance solution
Drones as an industry 4.0 maintenance solution

Rail Safety IDEA Project – July 2018
University of New Mexico
Case Study

4.0
Results

Graph 1: Comparison of max. temperature between IR and Contact sensor.

Graph 2: Comparison of %Ref. Vibration between LDV and SKF-Contact.
Conclusions

• The time consumed was reduced by 40% if compared by classic measurements.

• The cost was reduced as well.

• The measurement method has a good accuracy.
Thank you for your attention!
Danke für Ihre Aufmerksamkeit!

Mohammed Abdulaziz
mohammed.abdulaziz@stud.uni-due.de
+4917655458664