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Edusta 2011. Data processed Expert System for the Evaluation of Mast Security

The expert system EDUSTA 2011 is a new software solution designed to determinate the stability of mast-systems, like lamp-posts and anchor masts. The operators, mainly the municipalities and the cities but also operating companies at airports for instance, are responsible for the stability of there masts and the traffic safety.

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1. Introduction

The expert system EDUSTA 2011 is a new software solution designed to determinate the stability of mast-systems, like lamp-posts and anchor masts. The main purpose of this program is to provide an exact answer to one question: what is the life-expectancy of such masts? This is a very valuable information because a rusted mast can be a great danger for people and a high risk for any objects nearby if the mast should fall over due to obsolescence. The operators, mainly the municipalities and the cities but also operating companies at airports for instance, are responsible for the stability of there masts and the traffic safety.

Until now, a potential life expectancy of 25 years has been giving to all new installed masts without the possibility of measuring the corrosion, the rust or any damages that could affect the stability and security of the masts. This procedure will now be inherited by a much more reliable way, thanks to the EDUSTA software. The essential problem is that it is very hard to tell which masts are in a fine condition and which ones should be replaced. Most of the masts have the biggest appearance of corrosion and rust at ground level or even lower. That's why the ZWP *Anlagenservice* has developed a special technology to measure the corrosion of masts with a non-destructive ultrasound inspection. This inspection is called LIMAtest and was build in conjunction with the *Fraunhofer Institut for non-destructive testing* and the *University for Applied Sciences in Saarbrücken*. The results and data given by LIMAtest, like the material, the form or the weight of the

mast are then transferred into the EDUSTA Software, which calculates the stability of the tested mast and the remaining potential service life. Therefore, EDUSTA is able to provide an increment of safety by giving the exact number of years left before the masts should be renewed or, like in some cases, that this line has already been crossed.

2. LIMAtest

LIMAtest has a few precisely defined steps. The first step is the recording of all the data needed. These are for instance the height of the mast door to the point where the mast enters the ground, the mast circumference, the height of the light spot and more similar information. The second step is the ultrasound detection, during which an ultrasound-inspection head is fixed and guided around the post. This is the part where the corrosion and rust are measured by reflexions of the ultrasound energy. The third and last step before the evaluation of the data by EDUSTA is the analysis of the mast's conditions in the form of a scan.

LIMAtest has the big advantage to provide reliable information by using a completely non-destructive technology without any interference to road traffic, without any adverse effect on the post or its environment. Over 20.000 traffic light posts are being inspected by an operator in Germany within the next year

3. EDUSTA 2011

Two mast forms are being predominantly considered in this software: the traffic light post and the anchor mast.

To get a better impression of how this software is build, here are the two main masks that are considered in EDUSTA 2011, with some short explanations:

At first, the traffic light post:

1: In this field, some of the most basic information is inserted, like the material, the form and the number of extensions.

2: This area also includes important values like the height of the light spot, the casing depth or the wall thickness. These are all information provided by LIMAtest.

3: There are twelve different measurement data provided by LIMAtest considering the ultrasound inspection.

4: This is the final area where the calculated result appears, the evaluated life-expectancy.

And now the anchor mast:

1: The anchor mast has a similar amount of input values but furthermore also information about the wires fixed at the anchor mast.

4. Conclusion

EDUSTA is a very effective and extremely accurate solution to determinate the remaining service life-time of any kind of masts by considering important issues like the wind zone, location, bending, static and dynamic torsion effects and other environmental aspects.

That's why EDUSTA is the perfect software to support operators to maintain their traffic safety and keep the potential risk from outdated masts to a minimum with low financial outlay and without investing a lot of time.

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