Fault and maintenance information are recorded via app.

DIGITALISATION MAKES WHEELSET WEAR CALCULABLE

WHEELSETS OF RAIL VEHICLES MUST STAND HIGH LOADS AND WEAR UNEVENLY.

Wear depends on environmental conditions, the forces acting during braking, gradients and bends, weather respectively season and the rail profile.

The frequency of reprofiling has an enormous influence on the diameter of the tread and the service life of the wheelsets. Due to uneven wear and different intervals of the reprofiling, the end of the service life can only be determined very late, often even only shortly before having reached the end of service life.

In addition to that, wheelsets are subject to high safety standards, precisely because defects result in serious train accidents. Therefore, each wheel set, consisting of one axle and two wheels, must be regularly serviced and measured. This costs a lot of time and the measuring intervals cannot be predicted optimally. Above all, because the actual work steps to be carried out during repair are not known until the inspection.

This could be easily mapped with an asset management system such as zedas®asset and used for further analyses. If the wheelsets no longer comply with the safety guidelines, this would result in unscheduled failures. If wheelsets have to be replaced unexpectedly, problems can arise due to the long delivery times. In addition, there is a lack of short-term availability of workshop tracks and specialized staff. If the reprofiling and changing of wheelsets is planned for the long term, all resources can be allocated. The wheelset and material will have been delivered, a place in the workshop reserved and the vehicle will be ready for operation until the last day before the due date in the workshop. Forward-looking planning also has the advantage that it bundles orders and can thus lead to favourable purchase prices. Unnecessarily high stock levels are avoided and repeat orders are accelerated.

It is indeed possible to analyze the measurement data of the wheelset measuring device manually or semi-automatically. However, there is no comprehensive evaluation for all persons involved (such as workshop employees, maintenance coordinators, purchasing).
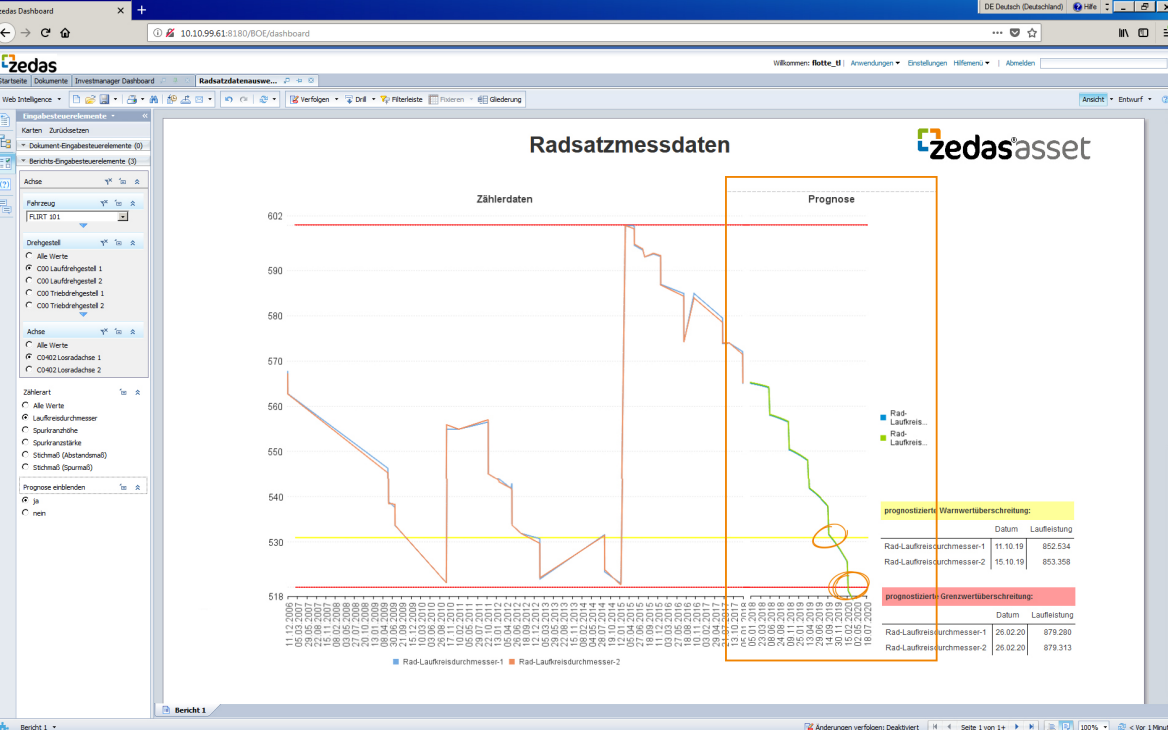
Fault and maintenance information are recorded via app.

Without any software support, the effort involved is disproportionately high and the end of the remaining service life of wheel sets can only be precisely determined at a very late stage. This often leads to the situation that many wheelsets have to be replaced at the same time. This leads to order peaks and idle times in the workshops.

What is the current consequence? In peak situations, wheelsets, workshop capacities, personnel or vehicles are purchased at short notice at high costs. Sometimes penalties have to be paid because transport contracts cannot be adhered to. In addition to economic damage, this also results in unsatisfied customers.

PREDICTIVE MAINTENANCE

In the age of digitalisation, the workshop is now also being digitalised. Using intelligent data diagnosis and analysis, the availability of systems and vehicles can be significantly increased. The measurement data of the wheelsets, which would otherwise have to be entered manually in an Excel spreadsheet, are imported into a central system via interfaces. All measurement, fault and repair data is available in a digital form and can be retrieved at any place. In this way, the responsible person always receives up-to-date status information and maintenance recommendations.

In the zedas®asset Dashboard, the wear of the wheelsets can not only be visualised, but also the optimum time for reprofiling or wheel set replacement can be determined long time in advance. If the monitoring is a permanently accompanying process, the system derives the parameters of the wear function from the measured data history for driving behavior, route profile, season, etc. independently and with increasing accuracy. Over time, the forecast is compared with the actual data and further specified. Among other things, operation, workshop and load data are included here. This means that wheelsets are used to their full technical capacity and unplanned workshop visits can be avoided.

As a digital assistant, the zedas®asset asset management system keeps an eye on deadlines, automatically notifies responsible persons of impending limit value exceedances or undershoots, monitors stock levels and submit order suggestions. Consequently minimum quantities of material are always available in the warehouse so that planned maintenance and repairs can be carried out. The smart assistant also considers delivery times, which are often quite long. Workshop times can now be announced well in advance, as the date for changing or servicing wheelsets is fixed for the long term. All parties involved are now well prepared for this. Material has been ordered at a favorable price without express delivery. In addition, the duty roster is written so that sufficient personnel are available. An additional advantage is that a complete ECM-compliant documentation is created during the entire maintenance process, as requested by law. In addition, the documentation is not only assigned to a vehicle, but is component specific. This means that, if, for example, a wheelset is exchanged, the wheelset always takes its digital history file with it. If a wheelset is installed in another vehicle, the component-specific history of mileage, installation data and maintenance measures is still traceable and verifiable.

CONCLUSION

Using intelligent, digital assistants, the maintenance of wheelsets becomes more economical and much easier to plan, the ideal time for wheelset replacement or reprofiling and the life cycle of rail vehicles can be precisely determined.

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