

The journey from breakdowns to breakthroughs in x-ray modules

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Machine maintenance in a traditional approach is more on a reactive side and thus doesn't contribute to reduce unplanned downtime. Technicians get the information once the machine is down, which is too late to avoid the unplanned downtime. In the lack of alternatives, a preventive approach is chosen in many cases, which can be applied to reduce downtime to a certain extent but not completely. If an x-ray module breaks, the inspection and production stop and this marks the beginning of the money guzzling. It is a race against the clock with the loss of production, absorption, and raw material backlog. An unplanned downtime of an x-ray system can easily take hours, and in case a replacement part is required, the machine could be down for days or even weeks. As a mitigation, replacement parts could be kept locally, but this creates inventory cost and requires space to stock the items. In an inline production environment, where 100% of the pieces are inspected, a predictive approach for maintenance is highly desired. The goal is to maximize the uptime, plan the downtime and perform maintenance well prepared with all required parts available on site. The x-ray modules from the latest generation can collect data during their use, which allows insights and judgement of the health state of the system in real time. Our journey already started some years ago by laying the foundations by incorporating these data acquisition capabilities. Monitoring critical parameters allows the adjustment of the process automatically and send notifications and alarms directly to maintenance and service organizations. If this is achieved early enough, preventive measures can be taken, and an intervention can be planned just in time. Operating modes can also be monitored. Understanding how the x-ray module is used helps to avoid excessive and surprising wear and tear. With this information, operating methods can be optimized, and customers suddenly become consultants. The intuitive human readable visualization of the data and system behavior helps to understand the big picture and enables preventive maintenance interventions, thus prevents unplanned downtime. With the cloud-based software as a service, it is our vision to improve data collection and processing algorithms towards accurate live system health reports to predict downtime and therefore maximize the uptime in production environments where inline inspection or high volume at-line is performed.