What Is OEE

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OEE is an abbreviation which stands for Overall Equipment Effectiveness. Defined by Wikipedia, OEE quantifies how well a manufacturing unit performs relative to its designed capacity, during the periods when it is scheduled to run.

Why is this important and what does it have to do with x-ray inspection equipment?

Inspection equipment is involved with the OEE calculation in two ways; the *Availability* of the equipment and the reject ratio measures part of the *Quality*. The other factor is *Performance* which is a measure of production against it's rated capacity.

1. The *Availability* Metric is a pure measurement of Uptime. The losses due to wasted availability are called *availability losses*.

2. The *Quality* Metric is a pure measurement of Process Yield. The losses due to defects and rework are called *quality losses.*

3. The *Performance* Metric is a pure measurement of speed. The losses due to wasted performance are also often called *speed losses*. In practice it is often difficult to determine speed losses, and a common approach is to merely assign the remaining unknown losses as speed looses.

OEE is calculated by:

OEE = *Availability(%) x Quality(%) x Performance(%)*
= *Time(minimum per part under ideal conditions) / Time(actual)*

Here are some Internet links for additional understanding.

http://www.oee.com/calculating-oee.html
http://en.wikipedia.org/wiki/Overall_equipment_effectiveness
http://www.oeetoolkit.com/

Availability is adversely effected when equipment is non-functional. Not only how often the equipment breaks, but how much time the equipment is not functional which includes the time to resolve and repair.

Traditional x-ray inspection equipment requires specialized training to diagnose and repair. There are alignment requirements between the x-ray generator and detector that requires live adjustments which can only be accomplished by qualified and well trained technicians. There are calibration procedures and component preparation processes to name a few. Component failure and subsequent delays associated with repair which require factory trained technicians on-site can seriously degrade OEE. Each problem can cause days of down time.

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Quality is adversely effected when inspection equipment makes mistakes, commonly called false detection, as well as actual issues with the production product. If an inspection machine is creating lots of rejections and everything is considered waste, yield can take a substantial hit. Even if reclaim processes are put in place to validate suspected product and recover good product, the very effort behind this work aversely effects the Quality score.

Traditional x-ray inspection equipment do not shield support personnel from the responsibility to understand the intricacy of algorithm adjustment. Poorly adjusted inspection equipment will not only provide poor protection against quality issues, but could result in significant false rejections which also can seriously degrade OEE. If factory trained technicians are required to properly setup the equipment, this too leads to degradation of Availability.

Armed with a solid understanding of OEE and how traditional x-ray equipment can negatively impact the entire production score, one can really appreciate the advantages of Novus X-Ray's CCPX™ technology. CCPX™ technology is a revolutionary improvement to x-ray technology Availability and Quality.

Availability is one of the biggest hurtles in deploying x-ray technology in critical control points. CCPX™ enables customer maintenance personal to service any aspect of the machine with minimal training by grouping all internal components into five modules which plug-and-play modules. No need for software or mechanical alignment procedures. The ability for the customer to maintain their own equipment with their own personnel, coupled with our one button automatic setup, enables rapid resolution of any problem, therefore maximizing up time and quality resulting in minimal impact on OEE.

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