

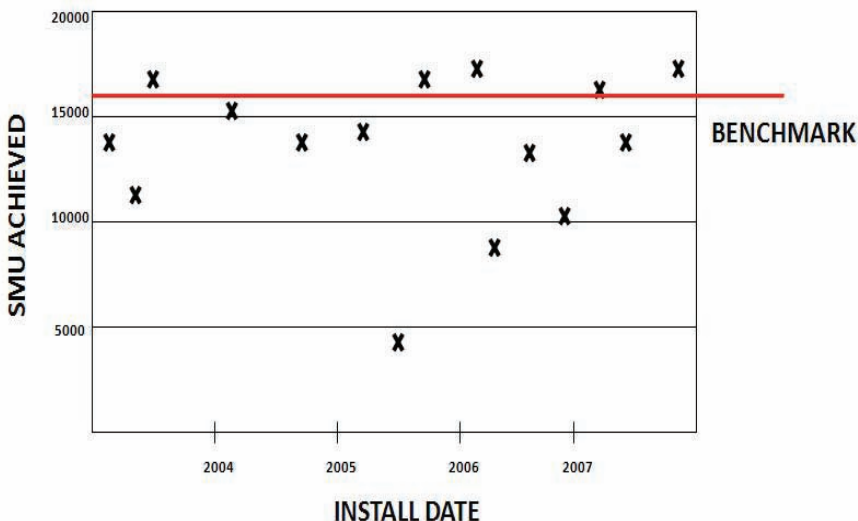
Radio-Frequency Identification: A Useful Way for Miners to Manage Mobile Equipment

By Michael Currie

Major component tracking represents one of the keys to success in managing the life cycle of large mobile equipment, but following parts' location is difficult because it is largely a manual process. [Radio Frequency Identification](#) (RFID), however, is purpose-built to track assets. The system is already being utilized in the [oil & gas](#) and construction applications, allowing operators to track major components in mining equipment and take advantage of a proven solution that offers utility, reliability and payback.

RFID has become particularly important since [International Financial Reporting Standards](#), or IFRS, were set in place. These accounting rules that will replace [GAAP](#) (Generally Accepted Accounting Principles) are already in place in over 100 countries. Canada will adopt IFRS in 2011 and the United States is set to comply by 2014. [IAS-16](#), a specific section that deals with property, plant and equipment, stipulates that replacement parts that have a cost that is significant relative to the original cost of the host equipment should be depreciated separately from the original asset. Large components that are repaired or exchanged to support the service life of mining equipment can no longer be expensed; they have to be depreciated according to their likely useful life. That means that they will have to be tracked as individual assets throughout their supply chain and in-service lives in order to satisfy these new accounting rules.

The challenge of tracking major components includes following the physical location and accumulated costs of serialized parts such as engines, wheel groups, struts, pumps, gearboxes and motors, as well as any large rotatable item that cycles through the host machine on a predictable timeline and is often rebuilt by a third-party or purchased on an exchange basis. A truck or shovel might have a dozen components worth tracking as they represent significant investments on their own. Unfortunately, the



The figure above shows the component life vs the install date

challenge of tracking rotatable parts often overwhelms asset management information systems because, while they are good at tracking tasks and costs associated with large serialized vehicles and their locations, they do not handle the lifecycle of the components that inhabit those locations very well. Other systems, such as [Cat VIMS](#), report the condition of the components, but not their identity.

There are recurring scenarios that lead to unnecessary risk and loss. For example:

- **The Warranty Gap**

Mines purchase major components for inventory and then issue that stock to work orders at a later date. The problem is that the issued part is usually just that – a part number, without any unique identity. Problems arise if the component suffers a premature failure because, to the supplier, the warranty on that component starts the day it was sold into stock but, to the mine, it ought to start the day it was installed. There is no problem if the in-service date can be verified, but with no physical component tracking that can be very difficult.

- **In-Service Component Swaps**

It is common for mines to swap components among machines. For example, a truck is in the shop being overhauled when there is a premature wheel failure on an operating truck and a replacement wheel is a week away. What does the mine do to maintain production? The answer is often to remove a wheel from the truck in the shop and install it on the operating vehicle. The new wheel is then installed on the idle truck when it arrives. This sets up a situation in which both trucks now have unmatched wheels, which often leads to untimely component change-outs that either waste remaining life or result in major failures because the normal benchmark was exceeded. This should not happen, but it does because the paper/ERP trail documenting component swaps is complicated, leaving maintenance staff unaware of previous switches.

- **Component Life Tracking**

To establish realistic component benchmarks, maintenance engineers need reliable data to create statistically reasonable life estimates using such tools as a [Weibull distribution](#). Obtaining this



Major Component Tracking requires an investment in tags, mobile devices to read them and a plan to store and utilize that information.

data can be one of the most frustrating issues in maintenance - how to consistently record actual hours achieved by major components in mining vehicles. The cost of not getting enough data is significant because, if the mine sets benchmarks too high, the mine will suffer unplanned downtime and extra expenses associated with major failures. If the benchmarks are too low, the mine will miss out on service hours that should have been achieved and thereby raise cost/ton.

• Core Tracking

When a component is replaced using an exchange part, the spent core is very valuable and needs to be tracked carefully from site to transport to receipt by the rebuilder. Unfortunately, cores go missing. Months can elapse between sale date and core return/credit, and often cores are lost altogether, costing thousands or tens of thousands of dollars. While it is usually smaller cores (cylinders, pumps) that get lost, large components are sometimes misdirected too, causing financial stress and critical shortages of exchange components necessary to support the life cycle of the fleet.

The RFID Solution

Radio frequency identification, or RFID, is an electronic bar code that allows information about tagged items to be tracked and networked. Location, date, cost and specifications are the most common pieces of information that are recorded. Because it is not an optical technology, tags can be permanently attached to industrial structures and equipment in harsh, dirty environments. Most people think of retail inventories when they consider RFID, but heavy-duty applications are becoming common as the technology becomes more robust.

If all of your components are tagged, you will know where they are and when they got there. Conceivably, you will also know who installed them and how many hours they have been operating. If you deploy even the most basic integration to your ERP, you will be able to reference previous repairs and parts lists. ■

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equipment and provides [products and services](#) based on LCC principles to clients operating around the world. He can be reached at mgcurrie@mgcurrie.com.

Links and References

- [CAT VIMS](#)
- [GAAP](#)
- [IAS-16](#)
- [IFRS](#)
- [Weibull Distribution](#)
- [Michael Currie](#)
- [Mobile Equipment Life Cycle Management](#)
- [RFID](#)
- [RFID Services](#)
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