Are you smart enough for smartPCN?

Stuart Broadbent, Obsolescence Director at Alstom and Chair of the International Institute of Obsolescence Management UK (IIOM) on communicating obsolescence in the rail industry

If you are the manufacturer of long-life cycle assets such as rail equipment, you know already that obsolescence is inevitable – the electronic components used in your systems controllers may be available for only five years, but your asset could have a planned operational life of 30 years or more. The challenge facing the rail industry is to ensure the continued operation of electronic systems well past the point at which the manufacturers no longer produce or support the components within them.

What is not inevitable is that you only find out that a spare part is no longer available when you try to order it, yet this is often the case for maintainers buying COTS (Commercial Off The Shelf) parts from distributors. The potential consequence of missing an end-of-life notification or obsolescence alert from a supplier is to have rolling stock out of service and higher obsolescence treatment costs.

With the high rate of electronic component obsolescence, it is perhaps not surprising that there is a whole eco-system to provide information about electronic component end of life; IIOM members such as SiliconExpert and IHS Markit provide data about electronic component availability and the forecast end of life of components, and provide the Life Time Buy (LTB) announcements from the manufacturers, allowing companies making electronic equipment to purchase stock of end of life components to enable them to fulfil customer orders and potentially extend the sales cycle for its product. They will also analyse your Bills of Material to identify component obsolescence in your product and propose alternative components, again enabling production to continue.

Outside the electronic component market, there is no standard way for a manufacturer to inform their customers of product change and discontinuation, and so the chances of an obsolescence alert arriving at the end user in time for action are low. If they exist at all, end of life announcements for mechanical and electrical parts are usually sent as a printed document, probably sent to their original contact name from years before at the company that used the part in its assembly; maybe to the original buyer, maybe to the engineer who originally chose the item. These end-of-life announcements have to find their way to whoever is now responsible for managing the part in the company, and processed manually to find the corresponding internal part numbers and use-cases.

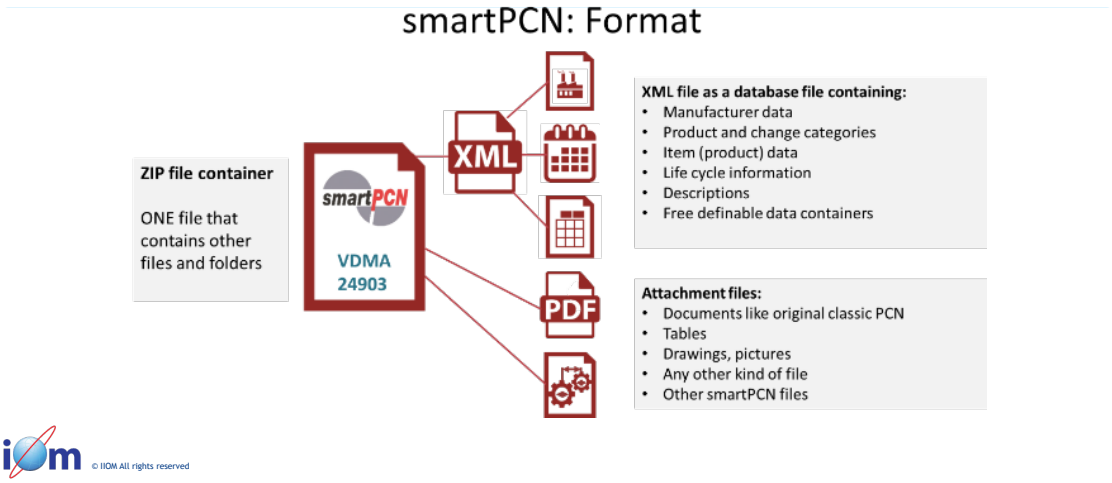
Product Discontinuance Notices may come by e-mail these days, but the content is usually a pdf file, hardly better than the paper document and now you have to print it yourself, and you still have to enter it manually into your system and notify your design department.

Developing a digital standard for product change information

If we use Information systems throughout our businesses, and exchange information electronically in our supply chains, why then do we accept documents that have to be transcribed laboriously into our information systems when they are about product change and product discontinuation?

This was the question that a working party of COGD, the German trade body for obsolescence management, and a chapter of the International Institute of Obsolescence Management (IIOM), set out to answer.

They looked at all the data fields required to communicate product change, from the name of the manufacturer and the MPNs (Manufacturer Part Numbers), to the nature of the change, and identified that there were 117 data fields that potentially needed to be communicated between manufacturer and



smartPCN: Scope

user, and that the user would also require supporting documentation, not only the formal product change notice but also, potentially, changes to user documentation and approval certificates.

COGD developed the smartPCN standard for digital interchange of product change and product discontinuation information, comprising a zip container containing an XML (eXtended Mark-up Language) file and documents, and identified 23 data fields that are mandatory; the associated XSD (XML Schema Definition) allows organisations to develop compliant database tables that are able to read and store a smartPCN.

COGD offers a zero-cost licence for organisations to use smartPCN, and it was adopted by Germany's machine tool industry as standard VDMA 24903.

Recognising that there are currently no international standards for digital communication of product change notices, IIOM is now proposing that smartPCN is included in the next version of the international standard for Obsolescence Management IEC62402.

Implementing smartPCN

It will take time for all participants in a particular industry's supply chain to adopt the smartPCN standard; it requires investment in information systems and changes to internal processes, and until digital exchange is mandated by customers or by international standards, it is easier to do nothing.

In order to expedite the introduction and application of smartPCN, IIOM business partner D+D+M developed their pcn.global database in 2016 as a repository of PCNs and PDNs received in manual format from suppliers and digitised by their experts. By using pcn.global and the associated pcn.cockpit system, their customers can identify smartPCNs that potentially match part numbers in their own system and manage them in a controlled process.

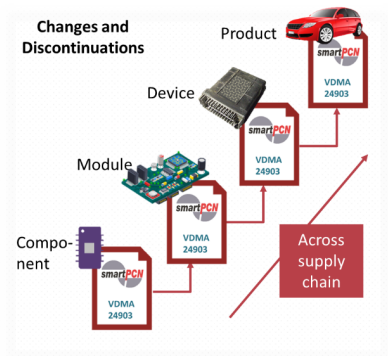
Companies like IIOM member Alstom have upgraded their in-house obsolescence management system to include a database of smartPCNs, and they have contracted with D+D+M to obtain smartPCNs from pcn.global. Using part number matching algorithms (that recognise that the names of manufacturers can change over time, and that there may be different ways of writing a particular part number) D+D+M's pcn.cockpit proposes smartPCNs that may be of interest to Alstom based on a list of manufacturer part numbers at risk of obsolescence, currently 40,000, provided by Alstom. These are analysed by Alstom engineers and relevant smartPCNs are loaded into Alstom's obsolescence management system. Further to this, Alstom sends all the manual PCNs and PDNs that it receives to D+D+M for digitisation, and these are automatically sent to Alstom.

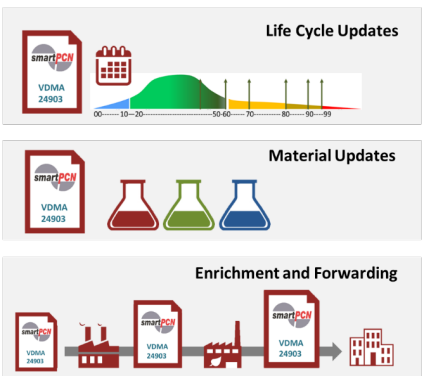
When relevant smartPCNs are received by Alstom, the manufacturer part numbers are cross-referenced to internal Alstom part numbers so that Alstom design authorities and operations around the world can be notified.

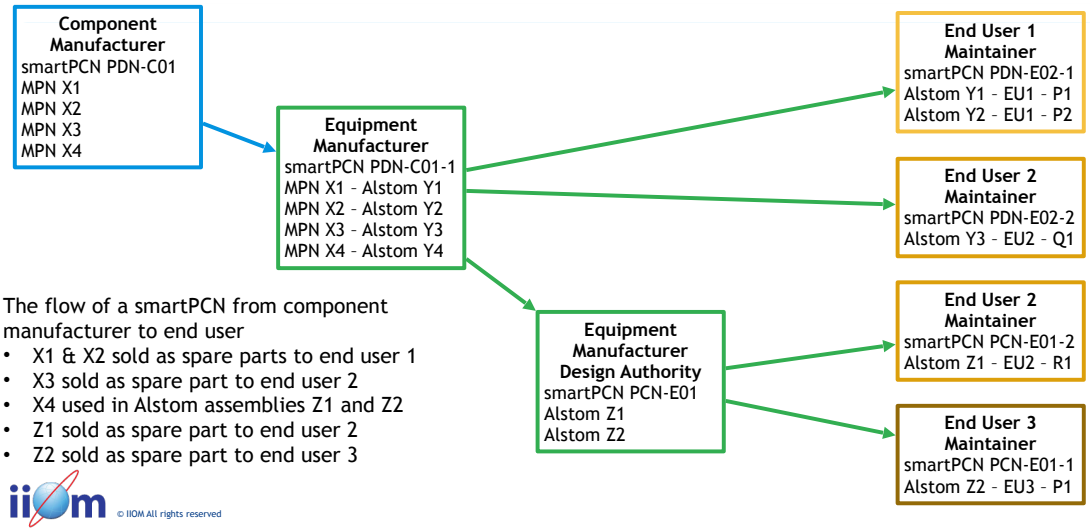
In the past, once the matches had been done from manual documents, the document would be archived, but now the smartPCN remains live so that manufacturer part numbers not matched at this stage can be checked in the future. For Alstom, this will be particularly useful when Bombardier Transportation's parts databases are migrated to Alstom's master parts management system; the smartPCNs can be rechecked for matches. For Alstom's operations and maintenance business, this function can also be used when taking on support contracts for non-Alstom rolling stock to identify possible obsolescence.

Although Alstom's implementation is focussing on Product Discontinuation Notices today, it is already looking at Product Change Notices to see how these can be used by the business; for example, for some product families such as power semiconductors, change of site of

smartPCN: Applications







The flow of a smartPCN from component manufacturer to end user

- X1 & X2 sold as spare parts to end user 1
- X3 sold as spare part to end user 2
- X4 used in Alstom assemblies Z1 and Z2
- Z1 sold as spare part to end user 2
- Z2 sold as spare part to end user 3

manufacture of the part has to be validated by the design authority of the equipment they are used in, sometimes with the requirement to redo a type test. Even if there is no change to form, fit or function, it can be important to inform end users of a change, particularly if the appearance of the part has changed or the (OEM) Original Equipment Manufacturer part number or revision has changed.

Alstom's customers are starting to ask for obsolescence alerts to be sent in the form of smartPCNs and Alstom is working with its customers to determine the best way to send smartPCNs to them. IIOM member AMSYS provides an IT platform for rail operators in Europe to share smartPCNs, and this provides a vendor neutral platform, but Alstom is also looking to use its own CRM platform to notify customers of smartPCNs, and wherever possible, Alstom will simplify processing at customers by including the customer's own part number on the smartPCN, and only include parts relevant to that customer, even if the source smartPCN included multiple part numbers.

A typical smartPCN will concern one or more similar parts from a manufacturer's product range with the same lifecycle, but realising that a smartPCN can include dissimilar parts, and can cover both product change and discontinuation, Alstom is looking to provide a composite smartPCN to customers that might include:

- A configuration change to the parent assembly to treat obsolescence.
- Lifetime buy opportunity for an end-of-life spare part for the assembly.
- Information about a replacement spare part.
- Technical Service Bulletin and Modification Instruction for the configuration change.

Alstom is looking to work with its suppliers and customers to improve the flow of product change and discontinuation information through the supply chain. In parallel, IIOM is continuing to promote smartPCN, and its smartPCN working group is planning a seminar in October 2022 to present the benefits of smartPCN to suppliers across industry groups.

Conclusion

The smartPCN standard will facilitate a step change in the way the rail industry manages obsolescence, and with current supply chain issues and shorter component lifecycles, the time is right for the rail industry to embrace the standard.

Some rail operators already include a clause in the production contract for the manufacturer to send alerts if spare parts become obsolete during the operating life of the rolling stock; implementation of smartPCN not only helps the manufacturer to create and distribute the alert, but also enables the operator to be able to process the alert in a timely manner.

It is also worth considering that in the United Kingdom, the operator may only have a short-term interest in the rolling stock – to the end of the operating lease – and it is the leasing company that needs to be aware of the long term obsolescence risk to their assets.

Sharing information and best practice

The International Institute of Obsolescence Management (IIOM) www.theiiom.org is the professional body for those involved in Obsolescence Management. The Institute is for professionals worldwide who wish to further their knowledge and understanding of the Obsolescence Management discipline, obtain professional recognition, and network with like-minded individuals from its global membership.

IIOM started in the United Kingdom as COG (Component Obsolescence Group) in 1997 and now has a long established Chapter in Germany, and new Chapters in France, India and USA, as well as the UK. Members come from all industry sectors and all levels of the supply chain, and are located in countries around the world; members include asset owners and operators of systems and equipment, manufacturers of systems, equipment and components, and obsolescence solution providers.

IIOM welcomes corporate and individual members, and has obsolescence solution providers among its corporate membership, as well as manufacturers and operators. These solution providers offer various obsolescence management services, including component monitoring, counterfeit avoidance, engineering & manufacturing solutions for obsolete designs, stocks of obsolete & end of life components, and training.

IIOM is a Professional Affiliate of the UK Engineering Council, and its professional recognition scheme includes the grades of Associate, Member and Fellow. IIOM has an Endorsed Trainer scheme with three training organisations delivering a short course that meets the requirements for the Associate grade.

Regular member meetings provide a mix of formal presentations and informal events at which obsolescence engineers, buyers and solution providers can exchange ideas - not just on obsolescence but also on key issues such as REACH, conflict minerals and counterfeiting. The meetings also provide access to the suppliers of the latest tools and systems developed to support obsolescence monitoring and management.

IIOM members were heavily involved in the development of the new version of IEC 62402:2019, issued in June 2019, and IIOM has made proposals for the next version of the standard; IIOM has a series of guidance booklets on various aspects of Obsolescence Management written by its members, including a Senior Executive guide to Obsolescence Management.

IIOM held its biennial International Conference and Workshop in Munich, Germany in May 2022.

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IIOM holds regular meetings in France, Germany, India, USA and United Kingdom; you can attend one meeting free of charge as our guest.
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