Best Practices for Enterprise Supply Chain Data Collection

Tord Dennis
James Cramer
WSP | Parsons Brinckerhoff
Santa Monica, CA

Abstract
One of the biggest challenges a corporate environmental compliance team faces is to collect complete and accurate material and substance data in a timely manner from suppliers. This paper will provide insight into some of the complexities involved in the logistics of supply chain data collection for RoHS, REACH, and Conflict Minerals. The paper will try to uncover why supply chain data collection is such a difficult task and propose some solutions (such as using industry standards like IPC-1752A) that companies can employ to make the process a little easier.

Introduction

Many companies and original equipment manufacturers (OEMs)spend years establishing and refining a product stewardship/environmental data collection process and a repository to collect and manage RoHS[1][1], REACH[2][2] and Conflict Minerals[3][3] data from their supply chain only to find out it is not as effective as they expected it to be. Some also find they get similar results when they hire a professional services firm to accomplish this task. Why do some companies do this activity well and others falter?

The reality is that this crucial business activity is highly dependent on getting accurate and timely data from the supply chain however most companies take their suppliers for granted. Many companies view their suppliers as low cost providers of off-the-shelf components and do not give too much thought to the process they go through to build these components. They view suppliers as unchanging catalogs of components that can be supplied on-demand and do not understand that suppliers face the same logistical and administrative challenges of employee turnover, cost management, that affect the big manufacturers.

OEMs and their suppliers often fail to understand and prioritize the need to comply with global environmental product regulations and manage the risk of discovering restricted substances in their supply chain. Environmental compliance is often not given the same level of importance as they do form, fit, and function until a problem is discovered and products are barred from the marketplace. This paper will bring to light some of the underlying problems in the supply chain that OEMs often overlook which cause downstream problems complying with global environmental product regulations.

Effectively Manage Supply Chain Information

Most companies underestimate the size and makeup of their supply chain. OEMs buy a lot of components from direct contract manufacturers (Tier 1 suppliers) who make them to their specific engineering requirements. But depending on the industry, a large portion of the final product that is sourced is through distributors because there are common components such as resistors and diodes which can be bought off-the-shelf. Most companies have no visibility into these sub-tier suppliers and therefore no leverage over them.

Keep supply chain information centralized

There are many entities (e.g., procurement, manufacturing, engineering, and billing) in the typical product manufacturing company that believes they own the supply chain information. Therefore everyone has their own personal silo of information which is only as current as the last time they had a need to contact the supplier. The best solution is to have a single centralized supplier database that everyone has access to instead of many dispersed imperfect copies. New suppliers and individuals added to the centralized database and any updates will be accessible to the entire organization. A centralized supplier database will also provide the best tool for ensuring consistency in supplier name nomenclature, reducing duplicates, improving indentification of supplier corporate headquarters and multiple satellite manufacturing and distribution locations.

---

[1] RoHS - Restriction of Hazardous Substances in Electrical and Electronic Equipmenthttp://ec.europa.eu/environment/waste/rohs_eee/events_rohs3_en.htm
[2] REACH - Registration, Evaluation, Authorisation and Restriction of Chemicalshttp://ec.europa.eu/enterprise/sectors/chemicals/reach/index_en.htm
[3] Conflict Minerals Law - Section 1502 of the Dodd–Frank Wall Street Reform and Consumer Protection Acthttp://www.sec.gov/News/Article/Detail/Article/1365171562058

This also improves ability for supply chain information to deal with the continual changes from things like mergers and acquisitions among the supply chain.

Keep supply chain information flexible

It is important to understand that the larger the supplier, the more likely they are to have a different point of contact for specific functions such as billing, design specifications, compliance, and contracts. The centralized database needs to be flexible enough to capture this state of information. This will encourage the different departments of a company to use the centralized database instead of trying to maintain their own.

Keep supply chain information up-to-date

Like every OEM, individuals at suppliers change jobs, email addresses, and phone numbers. And they do not automatically give that information to their customer so it is very likely that unless the OEM has done a refresh lately, 25 to 50% of the information is out-of-date. If the OEM has not refreshed its supply chain data in a while, it will be surprised to find out how many suppliers are no longer in business and how many no longer supply components to them. Make it a point to refresh this data at least once a year or whenever contracts are renewed.

OEMs will also discover that direct suppliers have the same problems in identifying their supply chains and keeping this information up-to-date. Depending on how many turnkey suppliers and assembly houses there are in the supply chain, a company may find that there are a large number of sub-tier suppliers that become the stumbling blocks for their direct suppliers.

Control the supply chain size

Many companies attempt to keep costs down by broadening the number of suppliers they can purchase a component from. This can result in a large number of suppliers from whom they purchase a relatively small number of components from; more unnecessary supplier data to bloat the database and to keep track of. It is best to concentrate spend on a small number of suppliers with moderate size lots than to broaden the spend on a large number of suppliers of small lots. A supplier from whom a company occasionally buys 1 or 2 lots from a year is far less likely to be responsive to requests for product environmental compliance information.

Build product environmental compliance requirements into supplier contracts

Suppliers are notoriously reluctant to share material content information because they consider it their "special sauce" that gives them competitive advantage. This may manifest itself as a supplier not wanting to name their suppliers out of fear that they may get cut out and the company will source directly from the other party. Or they may fear that once the OEM knows what is in the product it will build it themselves. It is important that suppliers understand that the OEM is asking for the ingredients and not the recipe. Just because the OEM knows a cake is made of 2 eggs and 1 pound of flour does not mean they can bake one like mom did. Non Disclosure agreements embedded with Supply Agreements may help to minimize these fears.

Also advising suppliers that Non-Disclosure agreements are in place with customers prior to any declarations of content. Suppliers must also understand that "no information means no business." We are all partners in the product development business and non-compliance to a regulation means that no one can sell any products. Build product compliance language into supplier contracts so that they are aware of their obligations. This is especially critical for distributors and entities that purchase components from a 3rd party. Suppliers must also be responsible for proactively reporting changes to the material and substance makeup of their components.

Manage wholesalers, distributors, and resellers

Buying components through a third party may be good for bottom line costs but wholesalers and distributors notoriously claim no responsibility to meet industry requirements and often have problems identifying their own supplier chain contact information. Sub-tier suppliers have no direct relationship with the OEM and will therefore be unresponsive to their request for data. As has already been stated above building product compliance requirements into supplier contracts is the most effective way to getting suppliers to collaborate and share product environmental compliance data.

Supply Chain Communication

It is important to realize that even though product environmental compliance, like accounting and taxes, is the cost of doing business many companies are not experts in this field so companies must make their needs clear and simple. Automation is the key to performing these tasks in an effective manner and companies must understand that the supplier works with many other companies so standards are critical to keeping things simple.

Simplify product environmental compliance specification

Many companies are under pressure to comply with multiple global regulations. It is important to determine which regulations apply to which products and focus the inquiry to each supplier. E.g., sending each supplier the entire tax code and letting them determine which ones apply to them only results in resistance and errors.

Be careful to not oversimplify the specification. Many companies today still ask for a declaration of compliance (DOC) or a Certificate of Compliance (COC) only to find out that in a few months the regulation changes and they must re-query the supplier for another document. Companies must strive to contact the supplier as infrequently as possible, get all the information in one attempt, and put the responsibility on the supplier to let the company know when something has changed with the component that may affect the compliance status of the product.

Collect full material declaration (FMD) data

FMD data enables OEMs to determine a product's or bill of materials' (BOM's) compliance against multiple changing regulations. In this process a company requests that the supplier report the name and mass of all the substances and materials that a component is made of. The supplier can also report if any exemptions to known regulations are applicable but generally the FMD data is regulation agnostic. With FMD data the OEM has the responsibility to search through the list for restricted substances. Typically a software tool such as a product lifecycle management (PLM) system is used for this purpose because it can quickly aggregate the component substances across a product's structure, roll up masses, and determine compliance against one or many regulations. This also helps in satisfying individual component supplier concerns because the mass and content of their component is merely another component in the final product soup.

Collecting FMD data early also minimizes supplier fatigue by delivering the complete material and substance breakdown at the beginning of the sourcing process. Once suppliers have gone through the possibly arduous task of determining the material and substance breakdown of a component, they only need to refresh the data if the component composition changes. Ask suppliers annually if the material and substance breakdown has changed; for 80% of the supply chain the answer will be "no."

Use a data collection industry standard

Suppliers quickly become overwhelmed with the amount of non-added value work they have to do and having to respond to the same type of request from each of their customers using a different form just adds to their frustration and increases the chances of errors. Many industries have created a united approach to addressing product environmental compliance regulations by creating a "standard" format for communicating information between companies.

The IPC organization for example has a developed family of standards dedicated to this task (e.g., IPC-1752A for material and substance declaration and IPC-1755 for conflict minerals). Individuals from many companies volunteer their time to serve on data exchange standards committees such as the IPC-175x[4][4] family of standards. The IPC-175x family of standards establishes a standard reporting format for data exchange between supply chain participants. They define the information that most companies need to collect in order to prove compliance. They also specify an XML-schema which allows for more efficient and effective communication of data. Tools such as spreadsheets can easily be adapted to the standards to enable an individual to input data and output an XML.

Automate the data collection process

For many large companies choice of automating the data collection is typically one of using a web-based portal versus an e-mail exchange. A portal enables the operator to dynamically track statistics such as: has the supplier begun the response, how many requests are outstanding, how many requests are complete, and what is the average turnaround time per supplier? Portals can also employ guidance mechanisms that lead the supplier through specific steps to leave no gaps in the data or incomplete information. Validation checks can also be implemented as part of the portal to avoid rework and time consuming communication cycles with the supplier. Email is asynchronous: a request is sent and the supplier works offline to complete

---

[4]http://www.ipc.org/ContentPage.aspx?pageid=Materials-Declaration

the declaration. Responses are tracked, retrieved, and analyzed by the PLM system when the supplier emails the FMD data as an attachment.

Both methods have advantages and disadvantages based on the company's unique business needs. It has been observed that many companies chose a phased approach to their FMD data collection process, beginning with email and gradually phasing in a well-defined portal strategy. The key is to choose a method that is:

Easy to use for the team and suppliers. Training is essential no matter which mechanism is chosen.

Fits within the company's cost structure.

Enables automated reminders to suppliers and escalations to the team when requests are outstanding.

Provides automatic checks and validations to improve data quality and reduce rework.

Supports industry standard formats such as IPC-1752A which reduces supplier frustration.

Purchase the FMD data from a data warehouse

If a product contains off-the-shelf components then it may be possible to purchase this information from a data warehouse/broker. There are a number of services in the marketplace who specialize in collecting and maintaining this information in a searchable database that can be securely accessed by remote systems. This is typically a good method for getting material and substance information for components that are purchased through a third party/distributor. Make sure the broker is vigilantly checking that the data is up-to-date and error free because now they are accountable for it and not the sub-tier supplier. The distributor/broker supply chain must also be tested for compliance and genuine versus counterfeit components.

Outsource product environmental data collection

Many companies employ a team of in-house compliance experts who manage the entire process from building the product environmental compliance requirements to conducting the data collection. However many quickly realize that interacting with suppliers is not the best use of their resources so they subcontract this work to a firm which specializes in this activity. A professional data collection services firm can do this more effectively because they have a team of dedicated people who perform this activity for other companies. The OEM must be careful to manage expectations, set realistic goals and not micro-manage the activities of the firm. A strong commitment is needed to support escalations with a good understanding that the services firm does not have any leverage over the supplier and needs the support of the OEM to get timely and accurate responses from those who do not comply.

Utilize a Product Lifecycle Management (PLM) System

A PLM tool can be configured to process and aggregate the approved FMD data into engineering and other product BOMs. It can calculate compliance against changing product environmental regulations and enable teams to pinpoint and anticipate risk before it arises. It can also preserve a record of every transaction with the supplier and archive FMD data as it evolves over the lifetime of a product. All members of a product development team can view material and substance information related to parts and components, understand concentrations at the component level, and roll up it up across entire product structures.

PLM system tools must operate in conjunction with a strong product change management system (process). Fortunately most companies with ISO certification have already addressed the change management process.

As with any enterprise data system, deployment of a PLM tool requires executive level support and a well thought out implementation plan. The tool is only as effective as the plan for using it.

Case Study

Since 2006 the authors have supported the product stewardship strategy of a large data storage company by acting as an extension of its team, focusing on improving product sustainability, environmental performance, and supply chain optimization. The data storage company proactively partners with its suppliers to obtain FMD data using the IPC-1752x family of standards for every component in the supply chain.

Support work by the authors has included:

Establishing corporate goals and metrics targets around product stewardship to drive process improvements.

Managing the environmental attributes of supplier-provided products by facilitating supplier engagement through training on the data storage company's environmental policies, and providing help desk support for FMD data collection.

Analyzing and preparing the data storage company customer sustainability reports which provide detailed breakdowns of product material composition and recyclability.

As a result of the collaboration, the data storage company's products consistently meet customer product environmental sustainability requirements and comply with worldwide regulations. This has helped the data storage company to be well positioned to anticipate, meet, and exceed customer expectations for product sustainability performance and reporting.

Summary
Keeping up with the latest product environmental data from suppliers and managing the risk of hazardous substances in the supply chain is critical to a company's success. The best approach is to be proactive and forward-looking; keep ahead of changing regulations and anticipate how they will affect the supply chain.

The OEM and the supplier are partners in this venture; "no data means no business" for all parties involved. Getting the most information possible in one task will enable the supplier to focus on their core business instead of constantly responding to inquiries and filling out forms. Include a statement in supplier contracts that requires them to provide documentation pursuant to any government's legal requirements regarding restricted materials and substances.

This will save a lot of discussion later with the suppliers over whether they are required to provide the necessary documents and if they should be paid to provide the data. The longer the supply chain is aware of the OEMs' requirements, the better. Again, in parallel to normal product development activities, the company must inform the supply chain of its intention to collect product stewardship data. This can eliminate many of the causes for supplier slow responses.

Empower and encourage the supplier to assume some responsibility in the product environmental compliance activity. Suppliers can be enabled to self-register and keep their data up-to-date by email or via a web portal. Make this a requirement in supplier contracts; send them a reminder every year if possible. And keep internal systems in sync automatically, do not rely on people to manually export supplier contact information and send them to another person to upload into their system.
If product stewardship specifications are kept simple and industry standard data exchange formats are used, the need for training and help desk support will be low but not completely eliminated.   Ultimately each company must realize that a system designed to automate functions is important as a tool used by the people that must be part of the system to ensure data accuracy, accessibility, and completeness.

The human touch cannot be eliminated completely. Emphasize the need for quick and timely responses from the supply chain. Send out a letter to the supply chain around a month into the data collection process re-emphasizing response requirements. Set reasonable, but firm, due dates and expect to have to walk some suppliers through the process. Supply chain response times to product environmental compliance data requests can be one of the most time consuming pieces of the data acquisition process. It can also be the most frustrating part of the process: do not expect that piece of the puzzle to fall into place easily.

Automate the data collection process. The manual exchange of documents means that the process often stops when the lead individual is out for any reason. For most companies this is just one of many tasks that the individual has to prioritize. Add in the task of validating the accuracy of the information and this becomes a labor intensive and error prone step that can be done more efficiently by software. Plan for on-going IT system maintenance and updates to the system as regulations and directives evolve.

If all of this seems to be too much to handle, consider outsourcing supply chain data collection and analysis to a firm that specializes in this area. Many companies see no problem in outsourcing the development of key components but fail to see the value and cost savings of having an external team handle this critical activity. Above all you must have executive awareness and buy-in at your company and at your supplier because "no data means no business" for all parties involved.

Best Practices for Enterprise Supply Chain Data Collection

Tord Dennis

James Cramer

WSP | Parsons Brinckerhoff

Santa Monica, CA

Global Regulations are Growing and Evolving

- RoHS exemptions are expiring in 2016

- Conflict Minerals
  - US law may evolve to require Independent Private Sector Audits (IPSAs)
  - China and the EU are exploring similar laws

- REACH
  - In 2015 the European Court of Justice (ECJ) issued ruled "once an article, always an article"
  - the 2018 deadline for registering substances is looming closer

Effectively Manage Supply Chain Information

- Challenges:
  - Understanding current regulations and anticipating changes
  - Understanding what information is necessary and where that information should come from

Effectively Manage Supply Chain Information

Best Practices:

- Keep the supply chain information centralized
- Keep the supply chain information flexible
- Keep the supply chain information up-to-date
- Control the size of supply chain
- Build product environmental compliance requirements into supplier contracts
- Manage wholesalers, distributors, and resellers

Supply Chain Communication

Challenges

- Getting accurate and timely material and substance information from the supply chain

- Analyzing the material and substance to determine product compliance

Supply Chain Communication

Best Practices:

- Simplify product environmental compliance specifications
- Collect full material declaration (FMD) data
- Use a data collection industry standard
- Automate the data collection process
- Utilize a Product Lifecycle Management (PLM) System
- Purchase the FMD data from a data warehouse/broker
- Outsource product environmental data collection

Case Study

- The author company has supported a data storage company's product stewardship program since 2006
- Product specifications and disclosure requirements are clearly stated in supplier contracts
- The data storage company collects FMD data on supplier parts using the IPC-175x family of standards
- Supplier FMD data is analyzed against RoHS, REACH, BNST, and other regulations
- FMD data helps to focus the scope for Conflict Minerals data collection

Summary

- Be proactive and forward-looking

- Have a strong product stewardship plan

- Include material and substance disclosure language in supplier contracts

- Get the most information possible – FMD

- Executive awareness and buy-in is critical!

- The OEM and the supplier are partners in this venture; "no data means no business" for all parties involved.

Best Practices for Enterprise Supply Chain Data Collection

Tord Dennis – tord.dennis@wspgroup.com

James Cramer – james.cramer@wspgroup.com

WSP | Parsons Brinckerhoff