The Plan for Every Part (PFEP)

By Chris Harris

Managers are making progress in creating areas of continuous flow as more managers learn about value-stream mapping and continuous-flow cells but many are having trouble sustaining steady output. The problem often is the lack of a lean material-handling system for purchased parts to support the cells.

These companies are becoming lean in terms of operating their cells, but they are still mass producers in supplying the cells. They lack the key elements of a door-to-door lean material handling system for purchased parts:

- a *Plan for Every Part*
- a properly located and managed *purchased-parts market*
- a rigorous *material-delivery route* using standard work
- *pull signals* to tightly link their areas of continuous flow to the supply of materials.

The consequence is starvation of processes, loss of flow, and a major waste of effort and money in keeping too much inventory and spending too much time hunting for missing items.

To introduce such a system, you have to understand everything about every part: How each part is purchased, received, packaged, stored, and delivered to its point of use. In fact, much of this information exists in your organization, but it is stored in many different places under the control of many managers and is mostly invisible. The first step in creating a lean material-handling system for purchased parts is collect all of the necessary parts information in one place – the *Plan for Every Part* (PFEP).

The chart below shows the most common categories of parts information for a PFEP. However, this is not a cookie cutter approach. Every plant is different. You might want to add columns that you need and take out ones that you don't find useful. Furthermore, as conditions change, the specific items in your PFEP may need to change. The watchword for the PFEP is flexibility, so you need to insure that your information management system is able to accommodate continuous change.

PFEP Data Elements

Part #	Number used to identify the material in the facility
Description	Material name (e.g., frame, bolt, nut, yoke)
Daily Usage	Maximum amount of material used in a day through the entire plant
Usage Location	Process/areas where the material is used (e.g., Cell 14)
Storage Location	Address (location) where the material is stored
Order Frequency	Frequency that the material is ordered from the supplier (e.g., daily, weekly, monthly, as required)
Supplier	Name of the material supplier
Supplier City	City where the supplier is located
Supplier State	(State, province, region, district) where the supplier is located
Supplier Country	Country where the supplier is located
Container Type	Packaging type of the container (e.g., cardboard box, reusable tote, wire basket)
Container Weight	Weight of an empty container
1 Part Weight	Weight of 1 unit of material
Total Package Weight	Weight of a full container of material
Container Length	Length or depth of the container
Container Width	Width of the container
Container Height	Height of the container
Usage Per Assembly	Number of parts required for 1 finished product
Hourly Usage	Maximum number of pieces used per hour
Standard Container Quantity	Piece count of material in one container
Containers Used Per Hour	Maximum number of containers required per hour

Shipment Size	Size of a standard shipment in days (1 week shipment = 5 days)
Carrier	Company providing parts-transportation services
Transit Time	Travel time required from the supplier to the facility (in days)
# of Cards In Loop	Number of pull signals that are in the system
Supplier Performance	Supplier performance rating that includes on-time delivery, quality, etc.

Source: *Making Materials Flow* workbook, Lean Enterprise Institute, www.lean.org

You'll want to make the information in the PFEP visible to everyone in the facility, and you'll need to sort the PFEP by categories (e.g., part description, order frequency, container type, and hourly usage). So, you'll need either a computer spreadsheet (such as Excel) or computer database (such as Access) to house the PFEP.

Most facilities start with an Excel spreadsheet. They may someday migrate the data into an Access database, but it's important to use a tool that is user friendly and has sorting capabilities

Fill the PFEP

After selecting the application, the next step is to load the data in the smallest element possible. For example, don't put a container's height, length, and width in one column. Create a separate category for each dimension (width, height, and length). This is critical information for designing storage locations. Similarly, avoid putting suppliers' addresses in one column. Break them up into city and state so you can sort by these categories in case you want to set up an external material movement system (milk runs) among plants.

Begin filling the PFEP with parts data from one cell. Add data cell-by-cell for all the cells in the value stream. Ultimately, it will include comprehensive information on every part in the entire facility.

Smaller facilities that have just one or two simple value streams may be able to develop and fill the PFEP from the outset with parts information for the entire plant. For larger facilities, it's important to start with a scope that you can manage. Managers who try to develop the PFEP for large facilities with many value streams all at once and risk not getting the project finished. Or even worse, they take shortcuts that compromise the quality of the data. It's much easier to start small and expand on your initial success than to get in over your head, fail, and have to start all over again - or to simply give up.

Establish the PFEP with an eye to the future. Other cells and value streams will need to use the same fields and format, and they wanted to avoid any significant rework of the PFEP as the implementation branched out.

In addition to managing current parts for current products, you'll want to use the PFEP when developing new products by making a rule that no new product can be moved to the production preparation stage without documenting complete PFEP data. An accurate PFEP, developed and tested well before the beginning of production, will be a powerful tool for the development team in guaranteeing trouble-free launches at target cost.

Maintaining the Integrity of the PFEP Data

Once you get all this information - and it probably will take more than one person to gather it all - the maintenance of it is not that time consuming. But you have to appoint a PFEP manager. This is the only person in the plant who can change and update the document. When there are too many people with the ability to change one document, the information will suffer. The PFEP manager is not often a full-time job. It normally only takes 10 to 30 minutes daily depending on the size of your plant.

While smaller facilities can appoint one PFEP manager for every value stream in the entire plant, large facilities may need more than one PFEP manager, assigned to different product-family value streams. In our experience, fewer PFEP managers will usually mean a more accurate PFEP.

You should also institute a guideline that requires every part to be documented in the PFEP and approved by the PFEP manager before it could appear on the shop floor. This is aided by a PFEP Change/Add Request Form.

PFEP Change/Add Request Form

Apex Production Control — Standards Form

Part Information	Current Data	Change To/Add
Part #	13596	
Description	Ferrule	
Daily Usage	690	
Usage Location	Cell 14	
Storage Location	Market	
Order Frequency	Daily	
Supplier	The Cabby	
Supplier City	Dayton	
Supplier State	OH	
Supplier Country	US	
Container Type	EXP.	
Container Weight (lbs.)	5	2.5
1 Part Weight (lbs.)	0.05	
Total Package Weight (lbs.)	10	5
Length (in.)	12	6
Width (in.)	6	
Height (in.)	6	
Usage Per Assembly	1	
Hourly Usage	90	
Standard Container Quantity	100	
Containers Used Per Hour	0.9	
Shipment Size	5 Days	
Carrier	Vitran	
Transit Time	3 Days	2 Days
# of Cards in Loop	2.7	
Supplier Performance	2	1

Explain the reason for change or addition:

Person submitting:_____

Position:_____

Date:_____

Approved by:_____ Production Control

Approved by:_____ Operations

Approved by:_____ Engineering

Source: *Making Materials Flow* workbook, Lean Enterprise Institute, www.lean.org

The person submitting the form only fills in the fields in the far right column that need to be changed or added to the PFEP.

By establishing a PFEP manager and developing precise guidelines for changes in any information in the PFEP, you ensure that the PFEP is always up-to-date and accompanied by a paper trail of changes. If done properly, this also makes it impossible to change a part on the floor without communicating that change to all affected departments.

For example, during routine operations your Production Control Department may use the PFEP as a quick reference to know what company supplies a part, where the supplier is located, and how long it takes to get the part. Operations could use the PFEP in an emergency, such as solving a problem with purchased-parts quality. Industrial Engineering may use the PFEP to reference container dimensions and design parts-presentation devices. If each of these groups could change the information in the absence of a formal process, the quality of the information would soon deteriorate.

The PFEP, once carefully established, filled with parts information, and properly managed, enables you to:

- Begin creating a lean material-handling system and subsequently developing purchased-parts market, delivery routes, and pull signals.
- Store pertinent current data on all parts in one central, accessible location.
- Sort parts data by various categories, such as container size, supplier location, and usage.
- Provide quick response to operations questions regarding parts and suppliers.
- Extend the lean material-handling system to your plant-to-plant material movements.

Is the PFEP Lean?

Is development and updating of the PFEP a value-creating process? No, because it does not directly create value from the standpoint of the customer. Instead, it is important incidental work that will significantly increase the percentage of value-creating activities that occur throughout your plant.

Many firms believe they have the functional equivalent of a PFEP "somewhere in the system," and wonder if creating and continually updating a PFEP as a distinct data set really creates value. The answer is that when information is in many places and hard for everyone to see, value-creating activities throughout the plant can't be supported with accurate and timely information. Wastes of many sorts become unavoidable.

Plan For Every Part – Keys to Success

• Select a PFEP format that has sorting capabilities (most common is a spreadsheet or database).
• Load data in the smallest element possible (e.g., container size should be entered as three different dimensions – length, width, and height).
• Appoint a PFEP manager responsible for the accuracy and updating of the PFEP.
• Ensure controlled maintenance of the PFEP through a set of guidelines.
• Establish a system to update the PFEP – a change request form.

About the Author

Chris Harris began his lean training on the assembly line at Toyota Motor Manufacturing Kentucky and continued his learning at Toyota Tsusho America in Georgetown, KY. He has a master of business administration degree from Anderson University, Anderson, IN. Chris now helps companies with their lean implementation efforts as a member of Harris Lean Systems Inc. He is co-author with Rick Harris and Earl Wilson of the *Making Materials Flow* workbook, published by the Lean Enterprise Institute.

Making Materials Flow shows manufacturing professionals in operations, production control, and industrial engineering how to replace material-handling systems designed for mass production with a system for purchased parts that supports lean production. The workbook reveals the exercises, formulas, standards, and forms needed for implementation. The key implementation steps detailed in the workbook include:

- Developing the Plan For Every Part (PFEP). This basic database fosters accurate and controlled inventory reduction and is the foundation for the continuous improvement of a facility's material-handling system.
- Building the purchased-parts market.
- Designing delivery routes.
- Implementing pull signals.
- Continuously improving the system.

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