

The BASELINE
PRODUCTION LAUNCH PROCESS
With Lean Principles at its Foundation

Dennis L. Harvey

First reported: October 9, 2005

This revision: January 3, 2010

EXECUTIVE SUMMARY

The *Baseline Production Launch Process* (B-PLP) offered by Dennis L Harvey Consulting, is the starting point to develop a client specific Production Launch Process which integrates with the client's best practices and business processes. Through years of development and experience, the lean attributes that form the foundation of the B-PLP have proven to work effectively and are easily adaptable to different launch situations.

Additionally, see *Baseline Production Launch Process.pdf* for an overview of the B-PLP.

This paper describes how the B-PLP embodies the principles of lean. The scope of lean used in this paper is the 14 Management Principles put forth in the book The Toyota Way by Jeffrey Liker (2004).

BACKGROUND

Over a ten years period, experience has shown that the most effective improvements to Production Launch Processes are those that most strongly embody the principles of lean. This continuous improvement includes direct involvement with more than 53 different program applications. These applications have included production launches of motor vehicles, powertrains, electrical equipment, locomotives, and light armored vehicles in both high and low volume situations. These improvements are now embodied in the Baseline Production Launch Processes (B-PLP).

The B-PLP is the starting point from which a client specific *Lean Production Launch* process is developed. When working with a client, it is advantageous to incorporate the client's best practices and business processes to facilitate implementation. However, care must be taken that these adaptations retain the lean attributes of the B-PLP described in this paper.

Experience has shown that the application of the B-PLP is facilitated if the client already has experience with lean implementation. If a client has experience applying lean principles to business processes, the lean attributes of the B-PLP will be easily recognizable. If a client has experience applying lean only to plant floor operations, more time can be taken to assure the client recognizes the advantages of lean applied to a business process.

Experience has also shown that implementation of a *Lean Production Launch* process is facilitated if it is described in terms of the client's definition of lean. Sometimes a client will define lean in terms of the tools applied. Sometimes, the definition will specify principles the client follows. Sometimes they go so far as to specify their own version of a production system. Regardless, the time is well spent to align the production launch process they implement with their lean definition.

If the reader is unfamiliar with the four sub-processes of the B-PLP or the production launch capability levels used to assess a client's capability, please see the Appendix at the end of this paper. These will be referred to throughout this paper.

In this paper, it was necessary to find a more universal definition of lean. Those familiar with lean usually acknowledge Toyota as the leader in the development and application of lean. For this reason, this paper uses the definition of a lean enterprise put forth by Jeffrey Liker in the book, The Toyota Way (2004). Liker proposes 14 Management Principles which are shown on page 2 and become the framework for the rest of this paper. Beginning on page 3, highlights of the B-PLP are organized by each of the 14 principles.

THE TOYOTA WAY 14 PRINCIPLES

From the book: *The Toyota Way* by Jeffrey Liker (2004)

Long-Term Philosophy

- Principle 1. Base your management decisions on a **long-term philosophy**, even at the expense of short-term goals.

The Right Process Will Produce the Right Result

- Principle 2. Create **continuous process flow** to bring problems to the surface.
- Principle 3. Use “**pull**” systems to avoid overproduction.
- Principle 4. **Level out the workload** (*heijunka*).
- Principle 5. Build a culture of **stopping to fix problems**, to get quality right the first time.
- Principle 6. **Standardized tasks** are the foundation for continuous improvement and employee empowerment.
- Principle 7. Use **visual control** so no problems are hidden.
- Principle 8. Use only **reliable, thoroughly tested technology** that serves your people and processes.

Add Value to the Organization by Developing Your People and Partners

- Principle 9. **Grow leaders** who thoroughly understand the work, live the philosophy and teach it to others.
- Principle 10. **Develop exceptional people and teams** who follow your company’s philosophy.
- Principle 11. **Respect your extended network of partners** and suppliers by challenging them and helping them improve.

Continuously Solving Root Problems Drives Organizational Learning

- Principle 12. Go and **see for yourself** to thoroughly understand the situation (*genchi genbutsu*).
- Principle 13. **Make decision slowly by consensus**, thoroughly considering all options: **implement decision rapidly**.
- Principle 14. **Become a learning organization** through relentless reflection (*heansei*) and continuous improvement (*kaizen*).

THE 14 TOYOTA WAY PRINCIPLES IN THE B-PLP

The following sections highlight how the Baseline Production Launch Process has been continuously improved to embody the principles of lean at its foundation.

Long-Term Philosophy

Principle 1. Base your management decisions on a **long-term philosophy**, even at the expense of short-term goals.

The long-term philosophy of a company is very company specific. However, in most companies that desire to be highly competitive, it is easy to find a rationale for implementing a production launch process and achieve Level 2, if not Level 3 performance for the benefit of the business. See Appendix for an explanation of Levels of Capability. The easiest fit is if the company also has lean as part of their long-term philosophy.

To illustrate long term potential for production launch capability, it's worth noting that this process has long term strategic significance for Manufacturing. In numerous cases, once Manufacturing demonstrates Level 2 capability, they have the profound knowledge and problem solving data by which to proactively drive improvements to upstream business processes in the company. These upstream improvements are not only in Manufacturing business processes (such as accurate Manufacturing Planning) but also business processes owned by other functional areas in which Manufacturing participates (such as Product Development and Program Management). Level 2 production launch capability becomes the enabler for the company to move to Level 3 and achieve further improvements in performance, cost savings, and customer satisfaction.

It is also important to tailor the production launch process to fit the culture and best practices of the company as these reflect the company's long term commitments. This also facilitates implementation and the eventual integration of production launch into the company's other business practices.

The Right Process Will Produce the Right Result

Principle 2. Create **continuous process flow** to bring problems to the surface.

The primary process, flow in a well run production launch process, is the flow of information and action pertaining to problem resolution. The procedures taught and mentored to the launch teams are designed to eliminate the time any problem resolution work sits idle or is waiting for someone to work on it. For example, the protocol for the Production Launch Integration Team when an issue is raised is to assign ownership to only a PLIT member so action is guaranteed. All the procedures in the B-PLP are designed to eliminate waste.

In addition to the continuous process flow for problem solving, there is also a continuous process flow for the reevaluation of activities with adjustments made to timing and activity content. This flow is the essence of *dynamic integration*.

Dynamic integration is being able to rebalance the program plan and complex activities in a launch when issues arise and doing it real time. Done well, a program will achieve the major milestones on time. It is important to have dynamic integration of all functional area activities that have launch responsibility. This is where teamwork is essential. The secret to success is for the team to follow norms that enable identification of emerging problems and then having rigorous shared responsibility for finding and implementing solutions.

Principle 3. Use **“pull” systems** to avoid overproduction.

In a well run production launch, the problem solving groups (PL Integration Team, Build Plan, Part Readiness, and the Build Issue Resolution teams) create the pull signal to the rest of the organization to solve problems. Though this may not at first seem unique from current practice, the difference is that in B-PLP a demand forecast can and must be made.

Additionally, a well run production launch is set up so these Production Launch problem solving teams become the only conduit through which pull signals are generated on behalf of Manufacturing. The rest of the organization needs to know that the production launch teams will be providing the pull signals, how they will provide the signal and that the rest of the organization will need to respond. Setting up the process in this way also eliminates a substantial amount of waste of activity that isn't critical to launch success.

Principle 4. **Level out the workload** (*heijunka*).

This principle is strongly reflected in the B-PLP, particularly in trying to level out the workload for problem solving. Problem solving activities (and therefore resource load) increases later in the launch, particularly during first build events. In the B-PLP, every effort is made to even out this workload throughout the program.

For companies performing at Level 2 capability, the strategy for leveling out the workload is twofold. First is to reduce the problem solving cycle time. Second is to charge the production launch Integration Team with “getting ahead of your problems” by pulling the discovery of problems as forward as possible; often before they actually emerge. This means those problems can be addressed earlier in the process when resources aren't overcommitted. An example of this kind of early discovery is the use of Failure Modes and Effects Analysis (FMEA) to reduce the quantity and severity of potential build issues.

For companies performing well at Level 3 capability, the strategy is to reduce the number of expected problems. This requires the organization as a whole to be working towards solving systemic root causes to problems that lead to extra cost and waste during production launch. Product design for manufacturability is often a focus of this effort.

Establishing the build plan also makes explicit the need for Manufacturing to maximize early product development activities for learning and problem solving. These activities include design reviews (or other activities to reduce potential of build problems) as well as scheduling early build events to match risks, estimated problem solving workload and learning curve.

Usually in the first applications of the production launch process (achieving Level 2 performance), build plans are not as robust as they need to be. The organization will see conspicuous waste. When an organization achieves Level 3 performance, the build plans are put together with benefit of historical performance, more realistic resource forecasts for problem solving and the elimination of root causes for many problems experienced in launch.

One of the two objectives of the Production Launch Integration Team is to identify problems as early as possible for resolution. This maximizes the chance to front load problem solving and thus reduce waste from rework. It also maximizes the chance to smooth out workload before the peak workload is experienced near the end of launch.

Principle 5. Build a culture of **stopping to fix problems**, to get quality right the first time.

This principle is present throughout the B-PLP. A particularly interesting place where this is made explicit is during the activities of the Build Issue Resolution Team. The teams are instructed to log every problem they experience. Best practice goes so far as to give production operators instructions as to what to look for in terms of types of problems.

Experience has shown that often production operators will solve problems their own way without making them visible to the organization. This is a common scenario for companies performing launches at Level 1 capability. One day that operator is absent and the substitute doesn't know about the fix. That hidden quality problem causes problems in production or worse yet, gets into the hands of the customer.

Principle 6. **Standardized tasks** are the foundation for continuous improvement and employee empowerment.

The best implementations of production launch use a common process at all locations. What this means is if you go from one plant to another, the process, the documentation, the vocabulary, the meeting agendas, everything is identical. This greatly facilitates shared learning and continuous improvement. When an improvement is created, it can be proliferated immediately to all sites and applications.

Another manifestation of standardized work is how Production Launch Integration Team meetings are run. It is common for a well run PLIT to meet for only an hour a week and during the meeting, status the complete plan (usually with more than 30 tasks currently in progress), document emerging issues, and pursue continued resolution on all open issues. Any issues that can not be resolved quickly are taken off-line by the participants that are needed. Results can be shared with the PLIT later.

Principle 7. Use **visual control** so no problems are hidden.

Visual control is most conspicuous in the Master Summary Report which documents the status of the Production Launch Integration Team's performance to plan. This document is limited to one page. From a distance, you can see (red or green) which activities are on track or which are experiencing issues. From a distance, you can also see which activities have issues that have been escalated for management help in resolution.

As mentioned earlier, another visual control mechanism is to make sure every problem is logged during early builds so they are not hidden and thus can be addressed.

Through the training and subsequent mentoring, members of the production launch teams are challenged to find ever better ways to use visual control to eliminate waste in performing their functions.

Principle 8. Use only **reliable, thoroughly tested technology** that serves your people and processes.

To date, the only technology that has been proposed to help serve the people and process of running a launch has been Information Technology (IT) solutions. These opportunities have been raised with the thought that they can help the flow of information for problem solving.

From experience, new IT solutions have not been required for success in implementing a production launch process. In fact, some of the best implementations had all documentation done on Excel spreadsheets or on posters. If a company has existing IT solutions for, say the distribution of problem documentation, this can be explored as a continuous improvement effort to Production Launch. However, adaptation of IT technology should never be a reason to delay getting started on achieving Level 2 capability.

Another place where IT solutions will not enhance production launch is attempting to automate the generation of the Master Summary Report from program scheduling and tracking tools. Experience has shown that the PLIT must be engaged first hand in assessing the status of every major launch related activity. The PLIT members must take responsibility to identify emerging issues which is beyond the capability or expectation of any IT solution to model.

Add Value to the Organization by Developing Your People and Partners

Principle 9. **Grow leaders** who thoroughly understand the work, live the philosophy and teach it to others.

A company's first implementation of a *Lean Production Launch* process should have a Production Launch Manager who has demonstrated skills in team leadership, a commitment to lean practices, and experience in production. Once the organization has experience with the *Lean Production Launch* process, they will find that the process is simple and standardized to the point where the position of Production Launch Manager can be filled as a developmental assignment. This provides an excellent opportunity for high potential employees to gain experience as leaders, learn first hand about launch and the application of lean to business processes.

To illustrate this point, one division had sixteen (16) different Production Launch Managers trained and running Production Launch Integration Teams over a 2 year period. To facilitate their success, many of the Integration Team members across these teams were the same people. This provided some continuity for the process and reduced the learning curve to bring teams on line. But the point remains; the Production Launch Manager's position could be used as a developmental assignment if the organization so desires.

Principle 10. **Develop exceptional people and teams** who follow your company's philosophy.

The production launch process is a team initiative. Creating effectively working teams is important to success. For companies who have committed to 6-Sigma, this is an excellent opportunity for Black Belts to play a role in support of team development. If a company is committed to teamwork and has organizational development resources to support team development, production launch is an excellent opportunity to apply these resources.

For companies which experience multiple launches, it is not uncommon that Production Launch Integration Team members are on multiple teams. This provides some continuity in the process and reduces learning curve for fast implementation. It also develops their expertise in a wide range of program situations.

Principle 11. **Respect your extended network of partners** and suppliers by challenging them and helping them improve.

There are two places in the *Baseline Production Launch Process* where this principle is most conspicuous. First is with at-risk suppliers who are monitored under the special activities of Part Readiness. The second is the extended network of people in the functional areas that support the launch but are not necessarily on the Production Launch Integration Team.

Part Readiness is an activity designed to work proactively with a select number of suppliers who add risk to the program success. This usually happens because the supplier had prior problems with delivery, historical quality problems, or the supplier is now going to produce a new part that carries a high risk to launch. Part Readiness monitors these special situations and brings emerging issues up early.

The second place this principle is evident is in the development of better cross-functional teamwork, not just for the Production Launch Integration Team representatives, but for the functional area members at large. This happens because the functional areas have an effective voice in the launch process and they can also share in the successes.

Continuously Solving Root Problems Drives Organizational Learning

Principle 12. Go and **see for yourself** to thoroughly understand the situation (*genchi genbutsu*).

Again, there are two places in the production launch where this principle is most conspicuous. First is during the Build Issue Resolution activity; second is in Part Readiness.

Setting up the Build Issue Resolution process requires the identification of the right people who have to be present at the build for problem resolution. If they can't be at the build site, they have to be at the daily status meetings and available to respond to calls and come to the site usually within minutes.

As mentioned earlier, Part Readiness provides the pull signal to the organization that further action with a supplier is required because a problem is emerging. Part Readiness pays close attention to the risk supplier situations usually with scheduled on site monitoring. Experience has shown that this activity is rarely handled well by expeditors since their pull signal is received late and is not tied to actually being on site and seeing the problem firsthand.

Principle 13. **Make decision slowly by consensus**, thoroughly considering all options: **implement decision rapidly**.

One of the first places where this principle is evident is in securing commitment in a Company to implement a *Lean Production Launch* process. Each functional area Director needs to understand the role their organization plays in *Lean Production Launch* and be committed to its successful implementation. To reach this point requires some effort. For example, many functional area Directors provide members to the Production Launch Integration Team with the understanding that their person is empowered to make decisions on behalf of their functional area. The team member will also be held responsible for the success of the Production Launch Integration Team as will all other members. This approach does work, but the Directors of the functional areas need to understand the details of how this will work and support it explicitly.

The one sentence description of this Principle does not give the reader an appreciation of other dimensions of this decision making approach. For example, the underlying concept is to make decisions when many have a chance to voice an opinion. Once consensus is reached (doesn't have to be slow), the decision is easy to implement.

The *Baseline Production Launch Process* takes this concept for cross-functional decision making as the driver for how teams are set up and the norms by which they operate. All interested parties are represented on the teams and empowered. Their voices are heard at the onset of issue resolution. Experience has shown that because the team works together on an ongoing basis, they already have an understanding of the balance that is required to solve issues. For this reason, it is relatively easy (and fast) to reach consensus and proceed with rapid implementation. Experience has shown that in the special situations where consensus can't be reached, the norms call for the issue to be escalated quickly for fast resolution.

Principle 14. **Become a learning organization** through relentless reflection (*heansei*) and continuous improvement (*kaizen*).

Experience has shown that well run Production Launch Integration Teams have no trouble finding opportunities to make continuous improvements to the process either during launches or as part of a lessons-learned debriefing at the end of a launch. The organization must take care that this quest for continuous improvement doesn't drive differences between launch applications but instead is spread between all launch activities for maximum benefit.

The most far reaching improvements to an organization will happen when Manufacturing is set to move to Level 3. This move usually will not happen effectively without the drive of an executive Champion.

The executive Champion who owns the production launch process most often is the Director of Manufacturing Engineering or an executive in Operations. As a Champion, they have a responsibility for continuous improvement of the process and would be the natural owner for driving improvements to Level 2. This Champion will find the job easier once success in Level 2 is achieved and the success is acknowledged by his or her peers in the other functional areas that participated in production launch.

Conclusion

When working with a client, adaptations of the B-PLP are generally limited to making the client specific *Lean Production Launch* process integrate with a client's other best practices and business processes, especially if they are lean. Because the *Baseline Production Launch Process* is lean and generic to begin with, the attributes spelled out in this paper usually remain included. This greatly reduces the time and effort a client will spend successfully implementing their production launch process and this means results will become apparent quickly.

APPENDIX – Additional Background

Sub-Processes of the B-PLP

The *Baseline Production Launch Process* is composed of four sub-processes. Dennis L Harvey Consulting describe these sub-processes in detail with flowcharts, procedures and other documentation which is not included in this paper and available only to clients. The overview definitions below should be sufficient for the reader to comprehend the context in which the Toyota Way 14 Management Principles are applied.

ACHIEVABLE BUILD PLAN: Starting with timing constraints, a team works to forecast build problems, then use tools (i.e. FMEA) to reduce risk and level the organization's workload for problem solving.

DYNAMIC INTEGRATION: This task is executed by a multi-functional team composed of members from all departments that have activities critical to production launch success. The team uses lean procedures for problem solving, visual control tracking, and providing the primary pull signal to the rest of the organization that action is required.

PART READINESS: A small team identifies at-risk parts and suppliers, develops action plans to stay on top of progress and provides the pull signal to organization if remedial action is required.

BUILD ISSUE RESOLUTION: A BIR team is established on the plant floor to identify all build issues and provide the pull signal to the rest of the organization for resolution. Action to get revised material must be fast.

Production Launch Capability Levels

Based on experience, Dennis L Harvey Consulting recognized that companies tended to fall into one of three levels of production launch capability. These capability levels are used to assess a client's current state and future state of performance. Below are descriptions of the three levels. For an expanded description, please request a reprint of the article, *How to Win at Production Launch* written for the Society of Manufacturing Engineers (December 2006).

LEVEL 1 CAPABILITY: Each production launch is treated as a special project. The projects rarely anticipate risks nor do they put into place the mechanisms to address risks early. Consequently, problems snowball into crises and require "fire-fighting" and extraordinary efforts. The mode of operation can deteriorate into just trying to survive.

LEVEL 2 CAPABILITY: A company uses a stable and *Lean Production Launch* process which gets results. This business process focuses on getting ahead of problems before they become crises. As success emerges, the rest of the organization recognizes that production launch capability as a new strength for Manufacturing.

LEVEL 3 CAPABILITY: A company uses a common production launch process on all launches and sizes each effort to the complexity of each program. Manufacturing now has knowledge and data to drive improvements to upstream business processes and the product design. Production launch is a well integrated part of the Product Development Process.