



RELIABLE BY DESIGN

The Six Most Common Issues in Full-line System Integration Projects and The Best Practice Approaches to Resolve Them

By Dale Seifert

Reduced costs, new products and added capacity drive the capital programs of most food processors. The meat, food, dairy and petfood industries continue to increase manufacturing efficiency while they meet their need for additional capacity and innovative products for which consumer demand is high and margins are more generous. Currently much capital spending is focused on consolidating and optimizing existing production lines to reduce costs and facilitate production flexibility.

Mepaco supports these projects with its full-line system integration capability in a collaborative partnership with its customers. We leverage our unique manufacturing capability and project execution expertise to minimize installation costs, meet target dates and deliver competitive advantage.

Our process is well defined (see diagram on page 3) and is designed to flexibly anticipate and facilitate the resolution of most obstacles. Nevertheless, each project is unique and issues do arise that can jeopardize successful completion.

These six are the most commonly encountered issues that we have experienced:

- **Multiple vendor integration responsibility**
- **Everyone is not on the same page**
- **Available floor space is insufficient to support production goals**
- **Product transfers, machine-to-machine**
- **Conflict of dual assignments: plant operation v. system integration**
- **Insufficient training and poor planning for actual start-up**

This paper will discuss the nature of these issues and provide insights into the best-practice steps to avoid or resolve them.

Multiple vendor integration responsibility

This issue is at the heart of timely, cost effective execution of a capital project. Problems arise when multiple vendors are permitted to “do their own thing.” As a result the processor is often faced with resolving the inevitable connectivity conflicts and the accompanying finger-pointing by vendors.

A best practice approach to resolving this problem is to appoint a reliable system integrator from among the vendors or from a third party to bring the project to completion on time and within budget.

Two critical criteria are important in the choice of a single system integrator.

1. The company chosen should have a track record of successful system integration projects with a demonstrable understanding of the relevant production process.

Knowing the production process down to the smallest operating activity will bring important expertise that assures a high level of line performance at the earliest date. As an example, a ground beef line has two key components; the grinder and the blender.

The grinder must be sized for the optimum grind size while delivering the production output required for the overall system. This must be done while insuring the integrity of the grind with little or no fattening out. The blender must be designed to deliver the required output and produce a very homogeneous blend, preferably with a standard deviation of 0.5% or less.

Another characteristic that processors should note when reviewing integrator credentials is a consistent pattern of innovative approaches and value-added recommendations in its proposals and its problem solving. In Mepaco’s experience, this characteristic can mean that a system will start up with almost no incidences and remain state-of-the-art for many years to come.

2. The integrator should have the space to assemble the complete line and debug the system prior to arrival at the customer site. Timely and coordinated sequencing of equipment arrivals is an important part of this process in order to eliminate what could be a schedule-breaking, costly problem. For instance, from the furthest point in the room should arrive first to eliminate having to maneuver around equipment. This requires scheduling that begins during the approval drawing process all the way through the loading of the trucks. As a result, the integrator will experience far fewer delays and headaches when maneuvering equipment at the job site.

It is highly recommended that the customer assign an individual to monitor the off site progress and provide feedback throughout the process. The good sense of this approach should quickly become obvious in the speed and seamlessness of the installation process.

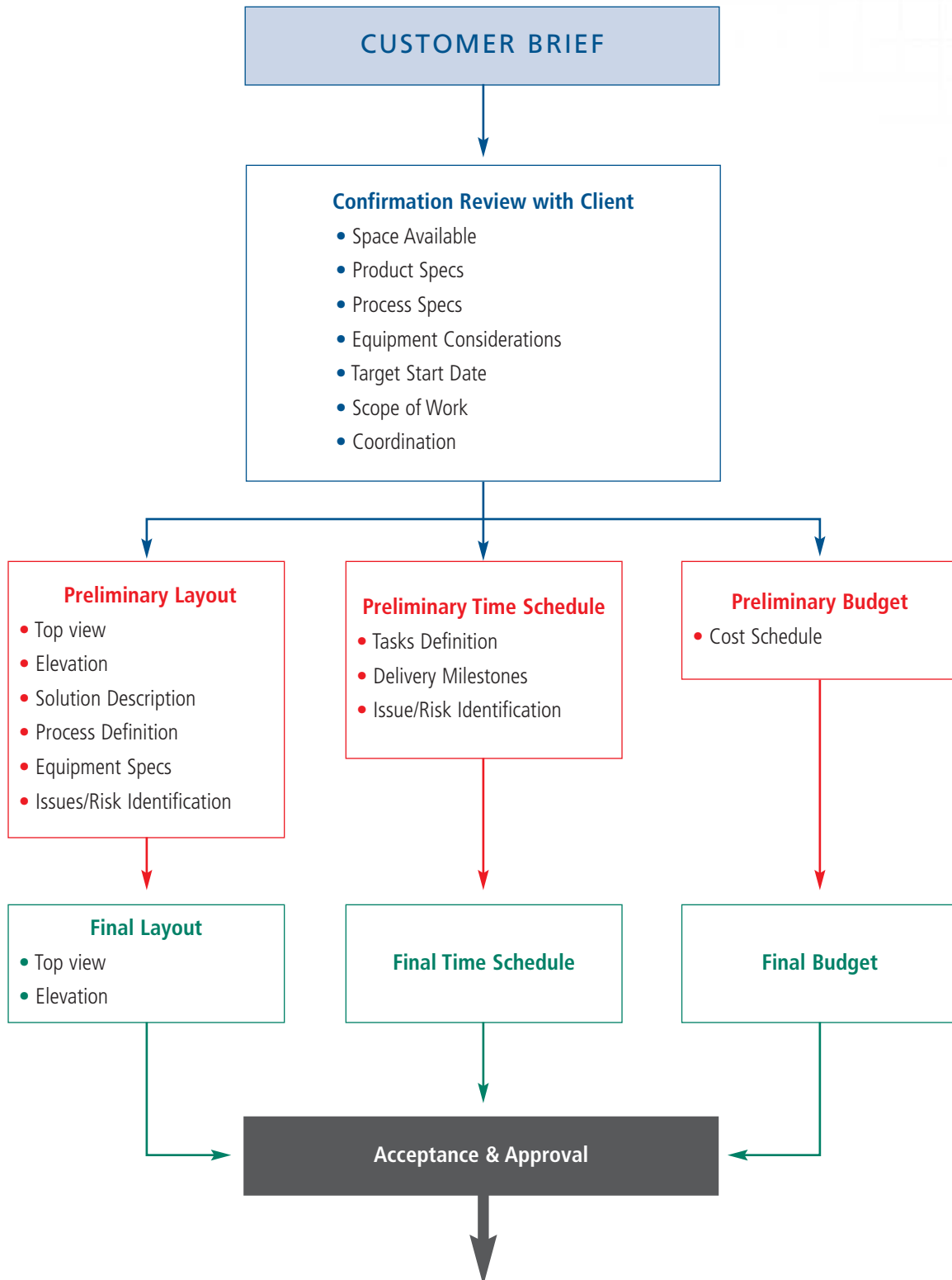
Everyone is not on the same page

Virtually every department in the plant is involved in the installation of a new production line, or even an individual piece of equipment. Production, engineering, safety, sanitation, IT, maintenance, human resources, quality, purchasing and management are all going to play a role at some point. The integrator must consider the installation from the viewpoint of each of these disciplines if the project is to be successful. At the end of the day, each piece of equipment should work in concert with the adjacent equipment in a safe, reliable and cleanable manner while meeting or exceeding the processors expectations for production and space. With food safety becoming ever more critical, the integrator must provide a system that adheres to the principles of sanitary design laid out by the governing agencies of the particular industry being served.

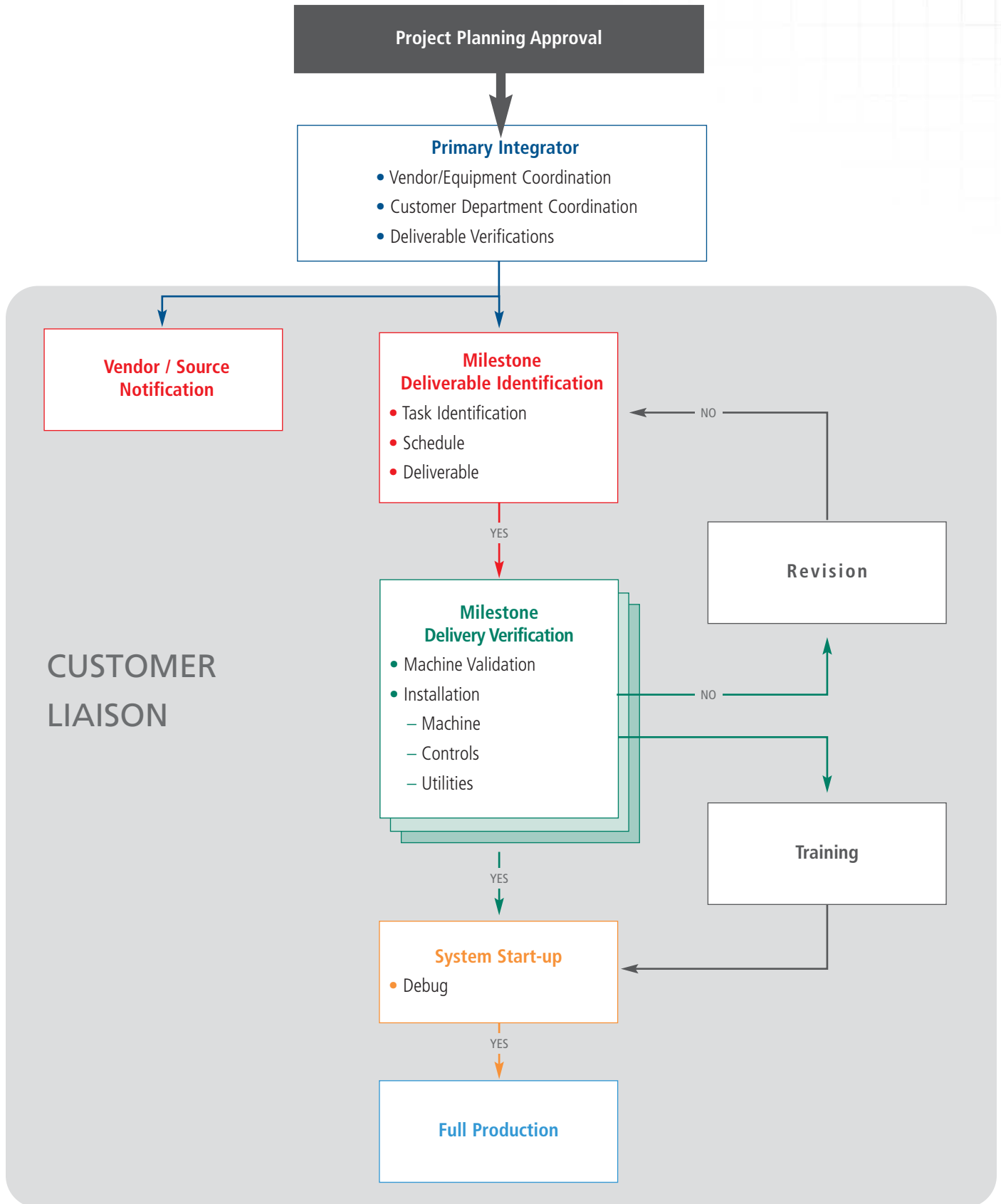
Most projects begin with the assumption that the customer team is of one mind and that the concern of each has been accommodated in the approved overall plan assigned to the project manager. The first problem is that this is not always the case and should not be taken for granted.

Knowing the production process down to the smallest operating activity will bring important expertise that assures a high level of line performance.

Project Planning



Project Management



The second problem is in assuming that the integrator or vendor group fully understands what the processor requires, or that every stakeholder fully understands what equipment and services are actually being provided. Bid packages and the resulting proposals are detailed and multi-faceted. Both the integrator and processor are typically in a time crunch and it is easy, though not excusable, for either group to miss or misunderstand something which can come back to inflict a serious setback on the project.

Once a proposal is accepted, the integrator and processor team needs to meet and complete a process review...it's a walk-through of the layout and sequence of installation with required resources.

All plant operating disciplines have an opportunity to comment, and their feedback is compiled and documented for both parties to employ in the ultimate execution of the plan. As the project progresses, regular and frequent meetings with the integrator, in person or via conference call, should take place to discuss progress, issues, changes and consequences and to answer questions. Communication is a critical responsibility for all stakeholders.

We recommend that the integration plan identify specific milestones at which details are reviewed with all stakeholders to assure unerring progress. In the Mepaco process diagram, milestones are specifically identified.

Finally, you can bet that "Murphy" will make an appearance on every job. So there should be a contingency process, if not a contingency plan. What should be done when something goes wrong...how should it be handled? A little forethought can be a big asset.

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Available floor space is insufficient to support production goals

Typically the processor's engineering staff has reviewed the available space, decided it is adequate and designated the location of the new line. If the space ultimately cannot accommodate the system, options must be explored.

If more space is unavailable or a new facility cannot be built, it may come down to the experience and cleverness of the integrator in selecting equipment that satisfies the space, production criteria and accessibility for maintenance and sanitation. The challenge can be likened to solving a jigsaw puzzle. Consideration should also be given to tweaking the production volume goal, altering the specifications for automation or allowing a shift in paradigm if challenges are to be overcome.

One tip is worth mentioning. Audit the construction drawings of the space, carefully reviewing the structural, utility and HVAC installation provisions to assure that pillars, heating ducts and sprinkler systems that are hung from the ceiling still provide sufficient space for installation, operation and maintenance of the system.

Product transfers, machine-to-machine

Transfers are a critical consideration in every plan. Poor product transfers can result in product quality degradation with resultant reduction in productivity, lost yields and heightened costs.

Experience is the key factor in planning transfers. The general rule is that the less a product is handled the better the product quality. In addition, different products have their own unique characteristics that may require different handling techniques to maintain quality and efficient conveyance. How to provide clean transfers (no product spillage) and eliminate manual handling or contamination must also be considered. This knowledge is the basis of an effective transfer process.

Conflict of dual assignments: plant operations v. line integration

Food processing plants are relying on leaner staffs these days. There was a time when set-up and installation of a new processing line, or even a single piece of equipment, was done by one or more plant engineers who were assigned this responsibility. Today, plant production engineers and maintenance managers are generalists, wearing many hats and fully engaged in keeping existing machinery and lines running optimally. Often, however, they are assigned to assist in the new installation while being expected to continue their every day duties

So what happens when something goes wrong on an existing line or during the installation of a new machine on another line? Will something have to give in order for on-site staff to handle both? What is the priority of those plant personnel assigned to the installation? How will the conflict be resolved?

On the face of it, this is a non-issue. Production always comes first. So, it's amazing that it's an issue at all. But the reality is that conflict often arises and can be the cause of considerable negative consequences. The common, best practice solution is to either employ an outside resource or to define a single, exclusive assignment for plant personnel.

Insufficient training and poor planning for actual start-up

Surprisingly, many successful installations have been plagued with start-up problems due to poor training and planning for unexpected consequences.

To remedy this, training courses for the different disciplines should occur prior to, during and even beyond start-up if necessary. Operations and maintenance manuals should be shipped with each piece of equipment. Additional copies should be on file with the applicable departments (i.e. sanitation, safety, maintenance, etc.) as well as the supplier.

A recommended spare parts list should be submitted well in advance of the system's arrival so that the processor has time to inventory the regularly used components as well as any components that have been identified as critical to eliminating long ("catastrophic") lead-times.

Nothing should stand in the way of starting up the system once it is in place and ready to be run through its paces... especially a relatively inexpensive component that may have been lost or damaged during the installation process.

Summary

Eliminating many of the problems encountered in typical system integration projects can be accomplished by selecting a single, experienced integrator who proposes a well-developed plan that addresses even the small details of the task. Critical to success is a company that knows the specific production process of the new line and offers innovative thinking and value-added recommendations in their plan. Equally important is the practice of initiating and maintaining an open dialogue with all project stakeholders including customer decision makers and vendor personnel. A single source integrator, knowledge of the process, a great plan and unfettered communication are the keys to success.

Mepaco, a food processing equipment manufacturer, is just such a company. It executes system integration projects in a collaborative partnership with its customers, leveraging its sizable, in-house manufacturing and unique services such as pickle passivating and electropolishing. These resources and its project execution experience minimize installation costs, meet target dates and deliver competitive advantage. Ask for references and case histories of our successes.

About the Author

Dale Seifert is the General Manager of Mepaco and has over 17 years of experience in food and meat processing equipment design and manufacture. Mepaco has been manufacturing food and meat processing equipment since 1932 and has pioneered solutions related to processing equipment and systems integration. Mepaco's "outside the box" thinking produces state-of-the-art solutions for even the most difficult applications.