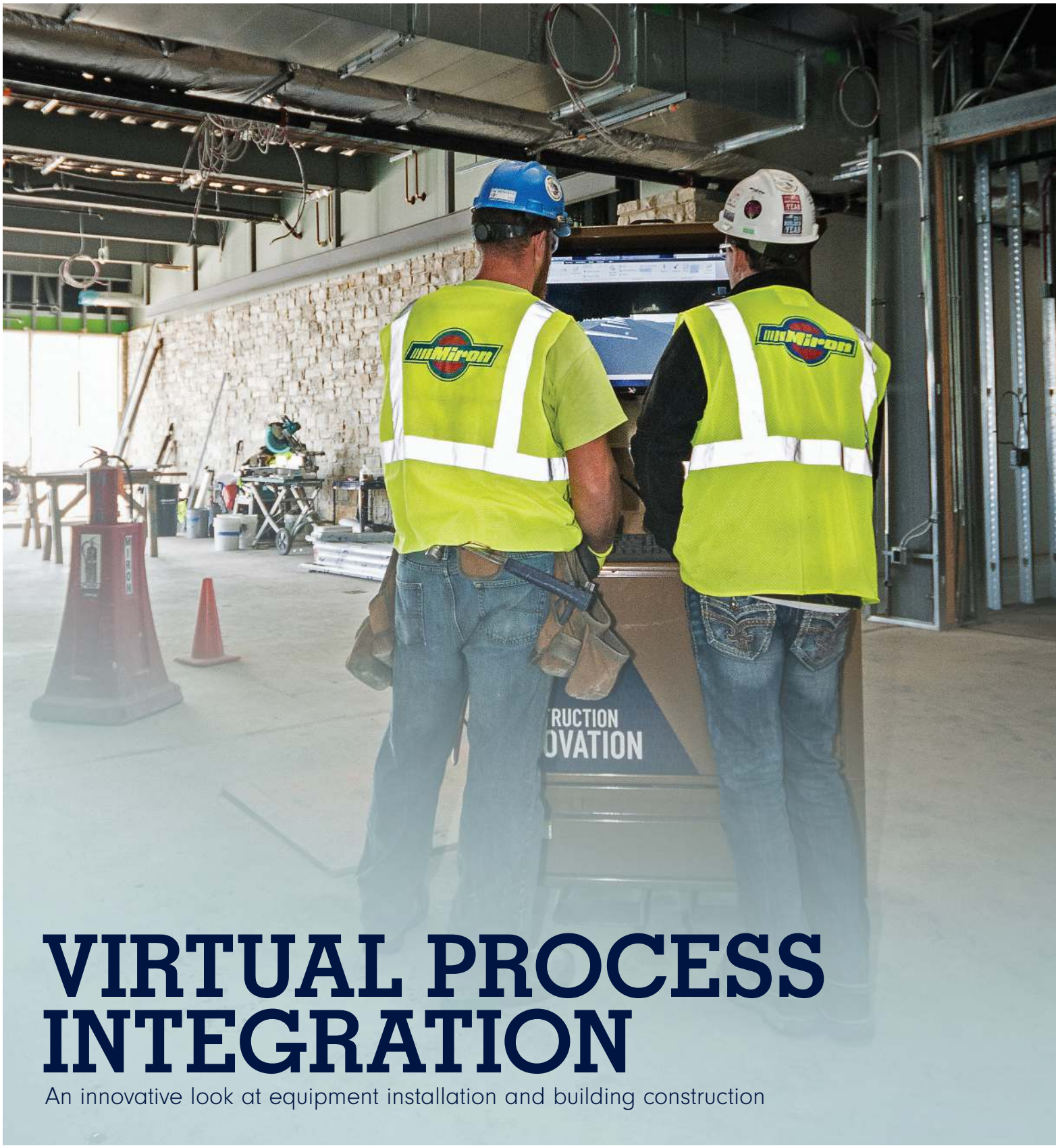


VIRTUAL PROCESS INTEGRATION

An innovative look at equipment installation and building construction

Miron

Building Excellence

Ci HUB

Virtual construction tools like VPI have been widely adopted during the design/engineering process. However, their use during construction/installation, in particular at the project site, has been restricted in the past due to technology limitations, or a narrow understanding of the benefits. Recently, Miron has realized greater efficiency and collaboration on project sites that utilize our new Construction Innovation (Ci) Hubs.

Miron's Ci Hubs are essentially modified gang boxes equipped with a TV monitor, computer, printer, and file-synchronizing software. A complete synchronized system provides the installation/ construction team with the 3D model and the digital drawing set right where they need it, just in time, and always current. Crews are trained to use the unit which provides everyone on site (including subcontractors) with the ability to access/view/print the plans, sections, and details, and coordinate with the design/engineering team real-time! Enhanced safety, quality and more efficient production are the result.

MIRON'S COMPETITIVE ADVANTAGE

Every plant manager's goal is to decrease downtime and increase productivity. This is especially true when it comes to the maintenance and installation of equipment within new and existing plants. Often, these projects require the removal and replacement of equipment in incredibly confined spaces. The effect this type of work has on production capacity can be astronomical. We understand that every second of downtime means dollars lost for our clients' organizations.

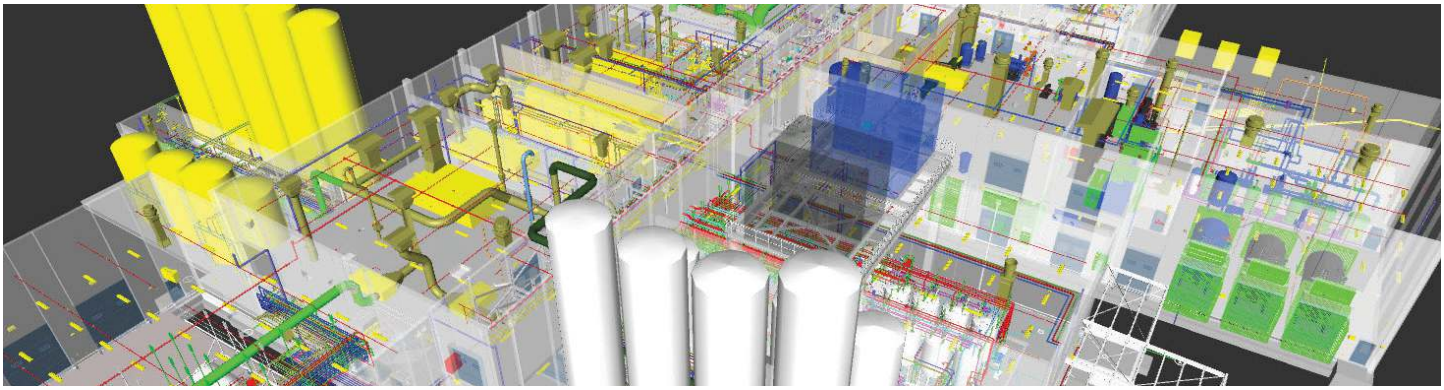
That is why Miron utilizes **Virtual Process Integration (VPI)** to help owners reduce downtime, decrease costs and add value to their equipment installation and construction work. VPI is an integrated team approach coupled with technology that helps clients and project teams visualize their projects in a whole new way, in an accurately displayed virtual environment. It involves the creation of a consolidated 3D model. Miron serves as the 'model integrator' and all design/engineering and subcontractor disciplines contribute to this living 3D model. This technology can greatly decrease errors by detecting conflicts/clashes between the pieces of equipment and the building. These clashes are identified prior to completion of the final design, ultimately providing a great deal of cost savings and streamlining the installation process.

By its very nature, VPI forces intense collaboration between the client, engineer and construction/installation team—the people executing the work in the field. The advantages of this integrated approach and use of VPI includes the following:

- Enhanced safety, operation and maintenance planning
- Reduced installation time and labor costs
- Elimination of change orders
- Reduced design documentation

"Ultimately, the team's ability to capture the client's goals, communicate those to all parties involved, create solutions that deliver on those goals and execute flawlessly, is what sets mediocre projects apart from truly successful ones. We believe an integrated approach that uses VPI at its core offers the highest chance of success."

Dan Bayer, Director of Virtual Construction
Miron Construction Co., Inc.



Eliminate Change Orders

It is incredibly important to utilize VPI to coordinate a critical area: the airspace between the building and process equipment in the building. "Airspace" between the piece of equipment and the building systems (like the mechanical, electrical and plumbing (MEP) systems) often gets overlooked, and tends to be the cause of many change orders and rework. VPI helps visualize the airspace and identify potential clashes/interferences. The equipment installation and surrounding facility is "built" virtually many times before it is done in the field. What is also unique about this process is the level of subcontractor involvement early in the design/engineering process, specifically the MEP disciplines. Unlike the traditional approach, the people executing the work are engaged upfront, thus allowing them to suggest design improvements based on their knowledge of how the installation could go most smoothly. Ultimately this prevents change orders during the installation and construction process.

Reduced Installation Time & Labor Costs

The ability to visualize the installation process in 3D also aids in sequencing and prefabricating major components. VPI allows the project manager to appropriately staff each sequence of the install, ensuring the right amount of manpower throughout the project. It also helps ensure that one group of contractors isn't installing out of sequence, there by preventing or delaying other teams in the process. No more delays due to waiting for material to arrive, or one discipline having to finish before others could begin, or having to rush and pay overtime. Finally, VPI accuracy guarantees that the installation occurs according to the estimated schedule so product hits the shelves according to plan.

Reduced Design Documentation

In the past, the design team developed extensive design documentation prior to engaging the contractors. Then the contractors developed fabrication drawings that were used to fabricate and install the equipment and systems. Inherently this process is extremely time consuming and riddled with conflicts between design drawings and fabrication drawings. By engaging the entire team earlier, VPI is used to transition directly from design concepts into fabrication modeling. This approach reduces unnecessary design documentation and improves coordination, ultimately saving time and money. The team also uses 3D laser scanning to reduce efforts associated with traditional field verification.

Maintenance Planning

Another value opportunity typically overlooked is planning for future machine maintenance. By utilizing VPI and integrating the engineering and construction team earlier in the process, the team is able to plan and design beyond just code requirements. For example, we can integrate ideal clearances needed for maintenance staff for all future maintenance activities. Safety and operational considerations are also incorporated into the project.

Outcomes

Miron's project experience demonstrates the powerful capabilities of Virtual Process Integration (VPI) in streamlining the machine design, prefabrication and installation process to achieve significant cost, material and time savings. Projects that Miron delivers using this approach often get completed with no change orders and shortened installation schedules.

MEET THE TEAM

Miron continues to raise the bar with innovation and best practices to provide unique solutions to our customers. No matter the size of the project, let our team demonstrate our commitment to delivering your vision and exceeding all expectations.

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