

## **Increase Safety During Compressed Schedule Shutdowns**

*Safety strategies reduce costs and delays during renovations*

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When production stops for facility renovations or retrofits, businesses lose access to their normal cash flow until production resumes. By nature, renovations are costly, which is why business owners demand compressed construction schedules – to reduce the time it takes to return to normal operation to produce revenue. To ensure smooth shutdown during construction projects, safety strategies must be implemented to ensure that projects are completed by their expected deadlines.

### **The Injury Factor**

According to the Construction Industry Institute (CII) in the US, the total cost of construction-related injuries exceeds \$7 billion annually. When injuries occur, owners and contractors are faced with both direct and indirect costs. These items drain resources from the start and often over the long-term.

Direct expenses include medical treatment, prescriptions, weekly wage replacement and other Workers' Compensation-related costs. Due to double-digit medical inflation, insurance companies pass on cost increases via higher premiums and building owners and plant managers are increasingly reviewing past injury claims to provide an indication of a contractor's safety record.

Indirect costs provide the real disruption to compressed schedules. There's an immediate work stoppage to care for the injured employee. Investigation of the injury further delays the project. Replacement workers must be trained. Any damage to materials, or equipment at the facility must be repaired or replaced.

Any work stoppage delays create financial risk. For owners, they have suspended production of their product – from steel to appliances to energy – that generates thousands or millions of dollars in revenue each day. For contractors, most renovation or retrofit projects include contract provisions that penalize the contractor for failing to meet deadlines.

### **Environment for Error**

According to the CII, shutdowns create an environment for error: "Although new projects do not show a significantly different safety performance when compared to renovation projects, shutdown projects were found to have poorer safety performances. Shutdowns are characterized as having tight schedules, significant amounts of overtime work, workers frequently working multiple shifts, and generally having a rapid buildup of the work force. When workers and managerial personnel work extended hours for one or two months, the possibility of human error increases, and so will the probability of injury causation."

## **Safety Strategies**

To better protect employees and prevent disruptions to compressed schedules, contractors and owners are building safety strategies into their renovation plans. To avoid costs and time delays, the use of safety strategies allows shutdown projects to be completed within a compressed schedule timeline.

Most strategies focus on two key areas: reduce the number of work hours required and reduce on-the-job hazards. Careful planning is required to meet both goals.

To reduce work hours, materials handling becomes critical. Workers are often injured when moving or installing construction materials. Contractors should arrange for suppliers to deliver materials as they are needed to avoid shifting items around the job site until they are needed. Taking steps to speed installation, such as using prefabricated parts of piping systems, helps workers complete tasks more quickly.

Contractors are also learning to avoid materials and techniques that are time-consuming to install. Grooved mechanical joining provides an effective pipe joining solution with superior benefits compared to welding, threading or flanging. For example, flame and fume welding techniques can demand as much as 45 percent more man hours over no-flame grooved mechanical joinery. In addition, grooved mechanical joining can be easily adapted to fit on-site job changes, which are particularly important during retrofit projects.

## **Safety Case In Point**

When International Steel Group's (now part of Mittal USA) Burns Harbor, Indiana, steel-making facility required a major rebuild of the No. 1 continuous slab caster, it needed efficient and reliable products and services to minimize operating disruptions. International Steel Group (ISG) turned to Victaulic, who 15 years earlier had installed a piping system in another part of the plant, making it one of the first steel mills to use grooved piping components on such a large scale.

The grooved mechanical joining method became a focal point for safety and schedule deadlines. All efforts were directed to help ISG to minimize lost revenue associated with the shutdown during the 42-day outage.

All materials were bagged-and-tagged — a system that ensures materials are organized in accordance with the construction schedule — reducing material handling and coordination in this case by 95 percent. ISG workers were trained to use Victaulic pipe grooving tools to allow on-site production, which reduced installation times. Victaulic couplings and valves are designed to offer faster installation than other pipe joining methods. The cumulative effect was to reduce overall work hours required to complete the project and to avoid hazards associated with other pipe joining methods.

The use of Victaulic piping components for ISG's utility piping systems was an important factor in enabling the piping contractor and plant forces to meet the installation schedule and allowing the plant to be brought back into production in the allotted time. The system's reduced total installed cost and speed and ease of installation allowed ISG to get the No. 1 caster up and running in the least amount of time and at the lowest possible cost — fulfilling the project's critical time and budget requirements.

### **Safety Makes a Difference**

When shutdowns are required for renovations, safety planning can make or break the project's potential for achieving key deadlines. When managing a compressed schedule, it's vital that contractors and owners work together to protect employee safety – and to enjoy the benefits of lower total installed costs and speedy return to normal operations.

### **Safety Impacts Schedule**

- Interruption of Work Schedule
- Training of Replacement Workers
- Administrative Time to Investigate Cause of Injury and Prepare Reports
- Repair or Replacement of Damaged Material, Equipment or Facility
- Any Required Cleanup of the Accident Scene
- Addressing Any Resulting Lawsuits