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A REALITY:
FOCUS ON SHUTDOWNS,
TURNAROUNDS, AND OUTAGES



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Making Zero Accidents A Reality: Focus on Shutdowns, Turnarounds, and Outages

**Prepared by
The Construction Industry Institute
Making Zero Accidents A Reality Research Team**

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Executive Summary

This research study extended prior CII studies that focused on effective safety practices on large construction projects. This effort focused on short duration projects that are commonly referred to as shutdowns, turnarounds, or outages. While different sectors of the construction industry use these terms interchangeably, the term shutdown is most common and will be used here.

This research was conducted by interviewing contractor personnel on 44 different shutdown projects. The shutdown projects included in this research had impressive safety performance records. The median injury rate for these projects was less than 0.7 OSHA recordable injuries per 200,000 worker hours of exposure. In addition, 50 percent of the projects reported having achieved zero OSHA recordable injuries. While these projects all had safety performance records well below the national average for the construction industry, differences between the safety performances of these shutdown projects were found to be associated with the differences in their work practices.

The study found that there are indeed unique aspects of shutdown projects that warrant particular concern. For example, shutdown projects with better safety records were those that were successful in transferring workers from other projects to perform the work. Better safety performances were also noted on projects that began hiring workers a few weeks before the shutdown. Safer performances resulted when shorter work weeks were worked and when shutdown durations were shorter in length, especially less than two weeks. Research also found that projects have better safety performance records when crews were smaller and when projects were completed under incentivized contracts.

The findings of the study on shutdowns are consistent with the findings of prior CII research on zero accidents. There is no simple or singular solution to achieving zero injuries. There also is no

single practice that makes a tremendous difference in safety performance in the absence of the other safety practices. Excellent safety performance is achieved through applying those practices that have shown to be effective, whether on large projects or on shutdown projects. This publication will be an aid to those who want to achieve safety excellence during shutdowns.

Introduction

The terms shutdowns, turnarounds, and outages are used interchangeably in some settings. For other personnel, these may have different and distinct meanings. For example, for power plants the term is generally “outage” but in the petrochemical arena the terms “shutdown” and “turnaround” are used with essentially the same meaning. For this study, there seemed little value in trying to define these terms. After several discussions with industry personnel, it became apparent that there simply is no consistent definition of these terms in the industry. Regardless, general terminology will suffice for this study. The term “shutdown” is used in this report, but the terms turnaround or outage could have been used as well.

In general, a shutdown occurs when an operating facility (process plant, power plant, paper mill, and so on) must stop operations while a modification or major repair is made to some facility component. To the owner of the facility, this cessation of operations generally stops the revenue stream. Thus, there is a great deal of interest in getting the facility operational as soon as possible. This means that the shutdown will be handled differently than are most typical construction projects.

The first major difference in shutdowns when compared to conventional construction projects is that work is often performed around the clock. The construction workers may work three consecutive seven 12-hour work weeks. Even the shift work makes shutdown work different from most conventional construction projects. In addition, to satisfy the short project duration schedule, the buildup of the work force is fast. This places a heavy burden on the construction firm to properly educate and train the new hires. All of these factors could compromise the safety performance of a contractor performing shutdown work if appropriate measures are

not taken. The goal of this study was to identify those practices that were associated with the better safety performances realized on shutdown projects.

Purpose and Methodology

This study was undertaken to identify current effective safety practices in that segment of the construction industry involving shutdowns. While it is recognized that some aspects of shutdowns are unique, the basic findings are expected to apply to other types of construction projects. Regardless of the type of project, the goal continues to be zero accidents.

Information was obtained through personal interviews that were conducted on 44 projects in various locations throughout the United States, with the largest number of projects being located along the Gulf Coast. Contacts were made with various contractors involved in industrial construction, the sector that is commonly most active in shutdown work. These shutdown projects were being performed by a few different construction firms, and it was apparent that shutdown work tends to be specialized with a small number of firms doing most of this work.

In conducting this study, contacts were made with personnel affiliated with shutdown projects. Participation in the study was completely voluntary and involved a commitment of about two hours to respond to an extensive interview questionnaire. The only firms that were not direct participants in the research were those reporting no shutdown projects being undertaken at the time.

When shutdown projects were identified for the researchers, onsite safety personnel were generally contacted directly to arrange an interview. During the telephone conversation, the purpose of the study was discussed along with a brief history of CII.