



Construction Industry Institute®

Finding Leading Indicators to Prevent Premature Starts to Construction

Construction Industry Institute

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Finding Leading Indicators to Prevent Premature Starts to Construction

**Prepared by
Construction Industry Institute
Research Team 323, Finding Leading Indicators to Prevent
Premature Starts, and Assuring Uninterrupted Construction**

**Research Summary 323-1
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Executive Summary

Construction projects have always faced pressure, from either the owner or contractor, to begin early mobilization of the construction phase. This is due to the fact that on nearly every project in the architectural, engineering, and construction (AEC) industry, at least one stakeholder stands to benefit from an early start. However, an early start does not come without its costs. In order to begin early mobilization, engineering design drawings can be rushed and assumptions left unmitigated, potentially resulting in inaccurate plans and unrealistic schedules. The construction phase of the project can then become impeded by costly interruptions and holds. Project teams often react to interruptions by spending more money and crashing schedules even further, causing additional strain for all project stakeholders.

In order to prevent these impacts and interruptions, the Construction Industry Institute (CII) commissioned Research Team 323 (RT-323) to gain a better understanding of what constitutes a premature start to construction, and to identify which factors drive the problem. RT-323's main objective was to define a premature start, determine what drives it, understand which impacts occur as a result, and investigate whether any leading indicators, or "red flags," exist to serve as early warning signs that the construction phase of a project is mobilizing prematurely.

To develop a basis for analysis, RT-323 defined a premature start as ***a decision, by at least one party, to start construction with at least one risk that exceeds an acceptable tolerance to a party and which can result in an interruption to construction.*** RT-323 conducted the research in two thrusts. The first thrust focused on identifying drivers, leading indicators, and impacts associated with premature starts by conducting case studies and a literature review. The second thrust focused on quantifying discoveries made in the initial thrust by surveying respondents that represent the construction industry.

RT-323 next developed the Premature Start Impact Analysis (PSIA) tool. This Excel spreadsheet incorporates the team's research findings into an interactive tool that can be used by various members

of a project team through all phases of construction. The primary purpose of the PSIA is to identify the potential impacts of user-reported leading indicators and drivers. The tool then guides the user toward reference materials and data compiled by RT-323, such as case studies and survey results. (The development of the PSIA and deployment recommendations are described in detail in Implementation Resource 323-2, *Premature Start Impact Analysis Tool: User Guide and Case Studies*.)

Throughout its research, RT-323 discovered many actions an organization should take to avoid premature starts to construction. The team developed the following list of items to take into account when considering project schedule, risk, and stakeholder alignment:

- Recognize the importance of schedule integration between engineering, procurement, and construction.
- Conduct a detailed risk analysis on front end costs versus potential benefits.
- Fully validate the constructability program and path of construction in relation to schedule.
- Provide construction contract access to procurement documentation.
- Establish an integrated team and assess joint capabilities to meet project requirements.

The primary value of the RT-323 research is in its identification of leading indicators that can signal a premature start, and its documentation of the drivers and impacts of premature starts to construction. Application of this research can facilitate communication between stakeholders and help project participants to improve productivity and predictability. RT-323 envisions that its findings will be incorporated into project risk assessment and overall planning, and that this research will contribute to the improvement of project delivery and stakeholder success for the benefit of the construction industry.

Introduction

Background

The Construction Industry Institute (CII) chartered Research Team 323 (RT-323) to investigate premature starts to construction and to document their drivers, leading indicators, and the impacts that can occur as a result. RT-323's early efforts involved defining what constitutes a premature start to construction. In order to develop a basis of analysis, RT-323 defined a premature start as ***a decision, by at least one party, to start construction with at least one risk that exceeds an acceptable tolerance to a party and which can result in an interruption to construction.*** With this definition, RT-323 hypothesized the various impacts that occur as a direct result of a premature start—theoretical outcomes that the team later confirmed to be true.

RT-323 postulated that the drivers that trigger a premature start and other leading indicators could be used to predict a premature start. This motivated the team to determine the extent of commonality for these drivers and leading indicators, and the severity of the impacts. RT-323 proposed that having this information prior to mobilization could warn a project team when the construction phase is beginning too soon, and indicate whether interruptions and other negative outcomes are likely.

Purpose and Objectives

The purpose of the research was to identify and document the drivers and impacts of premature starts to construction, and to identify any leading indicators that could signal a premature start, in order to avoid unintended construction interruptions. The objectives of this research involve taking the following actions:

1. Identifying leading indicators associated with premature starts.
2. Describing the drivers and impacts of these premature starts.

After performing these stages of research, RT-323 developed a Microsoft Excel spreadsheet, called the Premature Start Impact Analysis (PSIA) tool, that incorporates the research findings into an interactive tool that can be used by various team members throughout the project lifecycle. The primary purpose of the PSIA is to identify the potential impacts of premature starts, based on leading indicators and drivers. The tool then guides the user towards reference materials and data validation compiled by RT-323, such as case studies and additional survey data. The PSIA presents this information in conjunction with the anticipated impacts, in order to alert the user of the quantified impact data discovered by RT-323. (Development of the PSIA and deployment recommendations are described in detail in Implementation Resource (IR) 323-2, *Premature Start Impact Analysis Tool: User Guide and Case Studies*.)

Research Scope

The primary scope of this research involved reviewing past literature, conducting a survey, and pursuing case study-based research. Literature review guided the development of the research questions and initial drivers, which in turn led to the identification of the leading indicators and impacts that can signal a premature start. The team also held several brainstorming sessions prior to conducting surveys and case studies, in order to develop comprehensive criteria for classifying a premature start.

Because RT-323 was composed of members involved with a wide range of project definitions, the primary research focus was on project types within the expertise of the research team: design-build and design-bid-build projects. RT-323 members came from a variety of industry sectors, with project types ranging from the oil and gas industry to historical site renovations. Because of the diverse make-up of the research team, RT-323 derived much of its knowledge base from its members, some of whom could draw on over 20 years of construction industry experience.