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The True Impacts of Late Deliverables at the Construction Site

Construction Industry Institute

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**Prepared by
Construction Industry Institute
Research Team 300, The True Impact of Late Deliverables
at the Construction Site**

**Research Summary 300-1
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Executive Summary

The outcome of every construction project depends upon the delivery of all the proper resources delivered to the site at the appropriate time. Although this is common knowledge in the construction industry, late deliverables to the site continue to be a major impediment to project success. While it is common to track the cost and schedule impacts of late deliverables on projects, neither the full range of immediate impacts nor the secondary knock-on effects of late deliverables are typically recorded in any systematic way. Rather, project teams tend to become reactive when dealing with late deliverable events. This type of response leads to increased pressure on the traditional project goals: cost, schedule, safety, and quality performance. Furthermore, with the stress placed on meeting these goals, inordinate pressure is also placed on individuals, teams, and organizations; as a result, the collective functionality of all three—the project’s “organizational capacity”—is often impaired.

In order to understand the far-reaching impacts of late deliverables at the construction site, the Construction Industry Institute (CII), in collaboration with the Construction Users Roundtable (CURT), chartered Research Team (RT) 300, The True Impact of Late Deliverables at the Construction Site. CII tasked the team with investigating how various types of late deliverables affect the cost, schedule, quality, safety, and organizational performance on a project. RT 300 was specifically charged with identifying the most common types of late deliverables and their full range of impacts on projects.

The research team developed two main research thrusts: 1) understand and document the full range of potential late deliverables and the impacts and risks associated with them; and (2) examine how the construction industry currently perceives and manages late deliverables. The research project consisted of several parallel data collection efforts to identify types of late deliverables and to determine their impacts on the five project pillars: cost, schedule, quality, safety, and organizational capacity. Using 324 years of collective team expertise, a review of the existing literature, 240 industry surveys, 54 case study questionnaires,

and nine in-depth case studies, RT 300 compiled two extensive lists: first, a list of potential late deliverables, ranging from complex engineered equipment to design decisions to various types of human resources; and then an even broader list of the risks posed to projects by the late deliverables. After categorizing and defining all this information, the research team developed a database and an industry tool, the Late Deliverable Risk Catalog (LDRC). The LDRC tool, an MS Access-based database tool, provides filters as means of navigating the large database of impact and risk descriptions collected in the course of the RT 300 research process. (See Implementation Resource 300-2, Volume I, *Late Deliverable Risk Catalog: A User Guide*, and Volume II, *The True Impact of Late Deliverables: Case Study Summaries*, for detailed instructions, implementation recommendations, and proposed uses of the LDRC.) RT 300 developed the LDRC in a Web “app” format.

As RT 300 developed the LDRC, it also investigated how the construction industry currently perceives late deliverables and their impacts. The quantitative data the team collected provided several insights. First, industry professionals did not readily recognize the safety and quality risks associated with late deliverables. Second, while owners and contractors are aligned in understanding many of the impacts of late deliverables, there is room for improvement on several specific impacts. Third, according to industry professionals, the most common late deliverables are also the most severe. With these findings in mind, RT 300 designed the LDRC to enable project teams to recognize risks, improve alignment, and be proactive in managing late deliverables for reduced frequency and severity. Along with its recommendations for LDRC implementation and use, the team also formulated prevention recommendations for the highest-risk deliverables in the construction industry. All these resources can guide CII member companies and others involved in construction projects to an improved understanding of late deliverables, their impacts and risks, and prevention techniques. RT 300 is confident that the industry can use these materials to improve project delivery, productivity, and predictability, and to enhance safety, quality, and organizational and individual performance.

Introduction

Background

CII chartered Research Team (RT) 300, The True Impact of Late Deliverables at the Construction Site, in collaboration with the Construction Users Roundtable (CURT), to define and document the full range of impacts that late construction deliverables can have on a project. The research team's hypothesis was that the set of impacts that is traditionally associated with late deliveries—e.g., cost increases and schedule extensions—does not completely capture the full range of impacts experienced when materials, engineering, or other required project resources do not arrive on schedule at the construction site. The team's review of current industry and academic literature revealed that, while late deliverables are often cited as sources of change on projects, no existing research has examined the entire spectrum of deliverables or traced the full range impacts and risks created by their late delivery.

Purpose and Objectives

The research goals of RT 300 were to fill the void in research on late deliverables and their impacts, increase awareness of the broad range of risks from late deliverables, and focus on mechanisms for industry improvement. With experts from leading industry owner and contractor organizations, along with university academics, the team set out to accomplish these goals first through an in-depth survey to explore the impacts to projects of specific late deliverables, and then through broader surveys and questionnaires to determine how the industry currently perceives and reacts to late deliverables and subsequent impacts. The final RT 300 goals were to identify key causes and contributors, where possible, and develop a means of implementing and incorporating new knowledge and processes for preventing late deliverables—ultimately to improve project performance. The intention was to produce materials that would enable project teams to manage late deliverables proactively,

allowing them to identify related risks and prevent or mitigate the associated impacts. Given these goals, the team's work consisted of the following actions:

- reviewing current CII research, and industry and trade literature
- conducting 54 “mini” case study questionnaires and nine in-depth case studies of projects affected by late deliverables to construction
- developing and documenting a comprehensive set of definitions, to include types of late deliverables, categories of project impacts, and the project outcomes affected by late deliverables
- surveying over 240 industry experts to assess the relative frequency and impact severity of late delivery of each deliverable type
- developing a relational database tool, the Late Deliverable Risk Catalog (LDRC), that ties together key findings and project risks to make them easily accessible by project teams
- testing of the LDRC by owners and contractors to confirm its ability to help project teams quickly assess the impacts of late deliverables
- capturing a “starter list” of leading indicators and work practice recommendations that can help prevent late deliverables or identify the potential for late delivery, as early as possible.

This research summary discusses the research methods employed by RT 300, offers insight into several of the key findings and research products, and gives a brief overview of recommended processes for implementing the RT 300 products into existing organizational project processes. Research Report (RR) 300-11, *The True Impact of Late Deliverables at the Construction Site*, provides additional detail about the research process. IR 300-2 gives full instructions and implementation recommendations for the team's materials.

Research Scope

The primary focus of this research was to document and give visibility to the full range of impacts of late deliverables to construction, in terms of the safety, quality, schedule, cost, and organizational capacity on a construction project. (Organizational capacity is defined by RT 300 as the capability of people within an organization to execute work efficiently and effectively, with regard to teamwork, morale, team alignment, company alignment, relationships, and resources.) To this end, the research team developed several scope goals and limitations to guide the research process. The study addressed the full range of the types of deliverables required at the construction site beyond the basic material deliverables. Moreover, the team included in its scope the full range of impacts that can result from late deliveries.

The late deliverable categories the team identified were the basis for the case studies and research products; these categories include physical material deliverables, information and drawing deliverables, and the human and physical resources required to complete a project. Similarly, the team used its findings to break down the full range of potential impacts due to late deliverables into categories. The findings also showed that each of these impacts was associated with one or more of the five project pillars (i.e., cost, schedule, quality, safety, and organizational capacity). In the interest of clarity, communication, and ease of implementation, the team also included the definition of all these categories and pillars within the research scope. Furthermore, the team used several data gathering methods to determine how construction professionals perceive the impacts of late deliverables, and analyzed and incorporated these data into the research findings.

While the research team sought to investigate the range of categories and pillars, several limitations were necessary for a manageable research scope. To reflect the expertise of team members, RT 300 limited the range of projects it studied to the industrial construction sector. The team