



2014 Safety Report



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PAC 2014-2



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2014 Safety Report

Prepared by
Construction Industry Institute
Performance Assessment Committee

PAC 2014-2

April 2015

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The University of Texas at Austin

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Printed in the United States of America.

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Introduction

This report summarizes the responses of CII members to the 2014 Construction Industry Institute (CII) Annual Safety Survey. The survey was administered to all CII members between April and July of 2014. Among the 141 member organizations, 76 (i.e., 43 owners and 33 contractors) submitted their corporate safety statistics for the 2013 calendar year. These data represented a combined total of 2.83 billion work hours. This report presents the latest safety trends among CII members, and provides the corporate safety performance benchmarks for members to use for self-analysis.

The primary purpose of the 2014 CII Safety Report is to document the descriptive statistics obtained from the 2014 CII Annual Safety Survey. For the past few years, CII has chosen to limit the amount of commentary regarding potential causes for specific safety statistics or trends. The reasons behind many of the observations are left both for the reader to ponder and for CII to consider for further potential research.

1.1 Background

CII and its members have a long history of valuing safety and being committed to the goal of zero accidents. Reflecting this commitment, CII has funded many studies on safety since its founding in 1983. These studies have generated many of the safety practices that CII members and the architectural/engineering/construction (AEC) industry widely use today to deliver capital projects safely. As a part of CII's safety research effort, the CII Performance Assessment Program has collected annual corporate safety performance information from its member organizations since 1990 (for calendar year 1989 data).

1.2 Survey Instrument

The content, formatting, and deployment of the CII Annual Safety Survey have evolved over time to reflect changes in U.S. Occupational Safety and Health Administration (OSHA) reporting standards and to improve data integrity. CII has kept most of the survey questions consistent over time in order to establish safety trends. The latest survey was administered through an online survey instrument, which gathers the data by industry sector, location, and employee type. (See Figure 1.) The main data entry fields collected in the 2014 CII Safety Survey were the following:

- Total Work Hours
- Total Recordable Incident Cases
- Days Away and Restricted or Transferred (DART) Cases
- Days Away (DA) Cases
- Total Number of Days Associated with Days Away (DA) Cases
- Total Number of Days Associated with Job Restriction or Transfer (RT) Cases
- Number of Fatalities.

Work Type	Workhours	Total Number of Recordable Cases	Total Number of Cases with Days Away from Work	Total Accumulated Number of Days Away from Work	Total Number of Cases with Job Transfer or Restriction	Total Accumulated Number of Days of Job Transfer or Restriction	Total Number of Fatalities
Home Office							
Field							
Home Office							
Field							

Figure 1. Inputs for the CII Annual Safety Survey Instrument

The CII Safety Survey focuses on safety data associated with capital projects, excluding operations and maintenance. In addition, the survey includes questions regarding near misses, first aid cases, and fatalities. A copy of the 2014 CII Annual Safety Survey is available from CII upon request. CII aligns all safety terms used in the survey with OSHA definitions, in order to compare the survey results with

the yearly safety statistics that OSHA provides on the overall U.S. construction industry. Appendix A provides definitions of the key terms used throughout this report.

1.3 Reading reported rates

The reader should note that, throughout this report, smaller values of safety rates are considered better than higher values. If a rate increased since the previous report, the safety rate is said to have worsened. Otherwise, if a rate decreased since the previous report, it is said to have improved. These qualifications of rates as higher/lower or better/worse are used interchangeably throughout this report. Similarly, a given group (e.g., heavy industrial projects), are said to outperform other groups when its rates are smaller than the rates of other groups.

1.4 Key Findings

This year, the survey generated nine key findings:

1. As a group, CII members continued to outperform the U.S. construction industry by a substantial margin.
2. Companies reporting safety data in more than five subsequent years are still presenting lower (i.e., better) safety rates relative to other CII organizations. (See Figure 5.)
3. The building sector, along with the light industrial sector, presented the highest (i.e., worst) safety rates, and the heavy industrial sector still presented the lowest rates. (See Figures 6 and 7.)
4. Owner-reported data showed that the infrastructure sector experienced the highest DART and TRIR rates, and that the heavy industrial sector had the lowest rates. When observed over time, rates by industry sector seem to be improving with the exception of the infrastructure sector. (See Figures 8 through 11.)
5. Overall, U.S. safety rates are still higher than international rates. (See Figure 12 and Figure 13.)

6. The heavy industrial sector data presented the best rates for both U.S. and international projects. When the data were analyzed by location, sector, and respondent type, U.S. owner-reported data indicated higher rates across all sectors for both TRIR and DART, compared to the U.S. contractor-reported data—with the exception of the heavy industrial sector. (See Figures 15-17.) Comparisons between international and U.S. performance for the owner-reported data were possible only for the heavy industrial sector, which also experienced lower rates for international projects.
7. Both contractor and owner-reported data from U.S. projects indicated higher average DA and RT duration, compared to rates calculated from the international data. (See Figures 18 and 19.)
8. As in the past, most owners and contractors reported that they were tracking first aid incidents and near misses. (See Figures 22 and 23.) As in the previous report, both owners and contractors tracking first aid incidents presented better safety rates. (See Figures 24 and 25.)
9. Among CII members, fatality cases decreased substantially from 32 fatalities (up from 18 cases in 2011) in 2012 to 16 in 2013. The data reported since 1999 presents an overall downward trend. (See Figure 27.) “Contact with objects and equipment” and “falls” are among the major causes of fatalities. OSHA cases increased from 775 to 796 fatalities, but the construction industry fatality rate decreased from 9.5 to 9.4 cases per 100,000 full-time workers in 2013.
10. Data still indicate that the goal of zero accidents can be achieved. In fact, six CII members reported zero safety incidents across their organizations in 2013.

1.5. Limitations

As with previous annual safety surveys, CII owner and contractor members were asked to provide safety data for their direct-hire employees as well as for their contractors' employees. However, because contractors were not uniquely identified in the owner responses, some double reporting of contractor data is likely. This overlap often presents itself in two ways:

- owners reporting on their contractors' employees
- contractors reporting on their direct-hire employees.

In addition, the results for the building and infrastructure sectors may not be fully representative, due to small sample sizes. Consequently, readers should use caution when comparing results across sectors. With more and more CII members participating in the survey, and with CII continually expanding into the building and infrastructure sectors, these issues will likely improve in the near future.

Summary of Aggregated Data

This chapter presents the results of the aggregated data analyses for the 2014 CII Annual Safety Survey. Table 1 summarizes the aggregated 2013 safety data obtained through the survey. The total cumulative work hours increased seven percent from 2012 to 2013, and included 76 participating members (compared to 75 in the previous report). Table 1 also presents the aggregated data by respondent type (i.e., owner and contractor). As in previous years, contractors reported more than half of the total work hours, with a small increase from 58 percent of the total work hours in 2012, to 61 percent in 2013.

Table 1. 2013 Aggregated Safety Data

	Contractors	Owners	Total
Total Number of Recordable Cases	3,217	2,070	5,287
Total Work Hours	1,736,664,702	1,092,471,765	2,829,136,467
Total Number of DART Cases	1,492	304	1,796
Total Work Hours	1,773,755,078	592,928,819	2,366,683,897
Total Number of DA Cases	673	523	1,196
Total Work Hours	1,784,901,399	1,053,090,997	2,837,992,396
Total Number of Fatalities	10	6	16
Total Work Hours	1,784,930,013	1,098,671,765	2,883,601,778

The reader should note that some responding members could not provide all of the requested data or give details by category. (CII staff members prepare the final data set for this report each year, after considerable effort to validate the data.) For this reason, the total overall work hours reported differ for many of the metrics presented in Table 1 (e.g., for DART and recordable cases). In particular, some

owners had difficulty reporting information related to job restriction or transfer (RT) cases due to the short durations of the work tasks involved. As a result, data shown in Table 1 have been adjusted (where necessary) due to missing data uncovered during validation.

In 2013, 78 percent of the reported work hours were a result of international projects. Table 2 presets the reported work hours by the project location and by the location of the company that reported the data.

Table 2. Work Hours by Project and Company Location

Project Location	Domestic Company*	International Company	Total
International	1,426,138,792	778,606,889	2,204,745,681
U.S.	624,390,786	N/A	624,390,786
Grand Total	2,050,529,578	778,606,889	2,829,136,467

* Domestic company refers to companies that reported data from U.S. (even if the company's headquarters is abroad).

Table 3 compares the safety rates of the past two years. As a group, CII members' TRIR improved by seven percent from 2012 to 2013. When segmented by respondent, CII owner and contractor members experienced decreases of 14 and five percent, respectively, in their TRIR from 2012 to 2013. The overall DART rate increased by five percent from 2012 to 2013; however, this increase was found mainly among contractors, while the owners' rate experienced a 24-percent decrease. The overall fatality rate decreased substantially (i.e., by 49 percent) after a very high level in 2012. When examining the fatality rate by respondent, CII found that contractors had a 54-percent decrease in their collective fatality rate, while owners' fatality rates decreased by 60 percent.

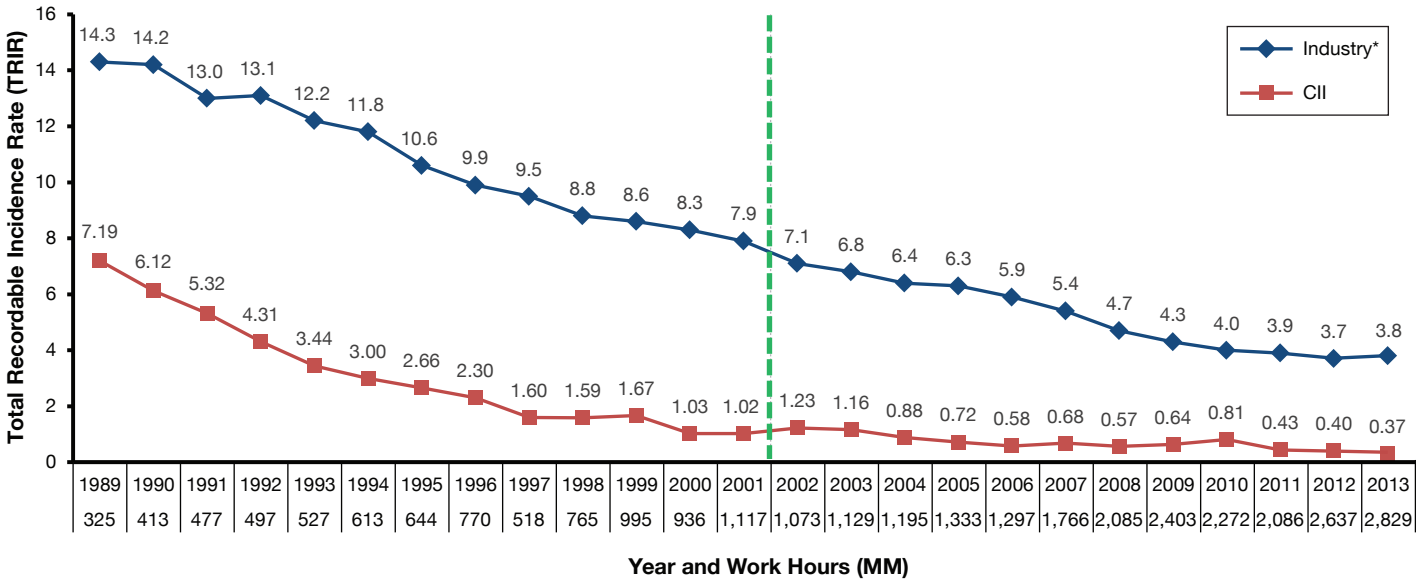
To get the results considered in this report, CII calculates the DART, TRIR, and fatality rates consistent with OSHA definitions. This means that the data shown for DART and TRIR note the number of cases or recordable injuries (respectively) for 100 workers working

Table 3. Incident Rates and Changes from 2012 to 2013

Respondents	Metric	2012	2013	Change
All	TRIR	0.404	0.374	-7%
	DART Rate	0.145	0.152	5%
	DA Rate	0.074	0.084	14%
	Fatalities	2.412	1.110	-54%
Owners	TRIR	0.421	0.379	-10%
	DART Rate	0.135	0.103	-24%
	DA Rate	0.096	0.099	3%
	Fatalities	2.707	1.092	-60%
Contractors	TRIR	0.392	0.370	-5%
	DART Rate	0.151	0.168	11%
	DA Rate	0.059	0.075	28%
	Fatalities	2.201	1.120	-49%

40 hours a week for 50 weeks each year (i.e., 2,000 hours per worker per year). The calculations for the fatality rate differ from these; it is determined by the number of fatalities occurring among 100,000 workers working for a full year.

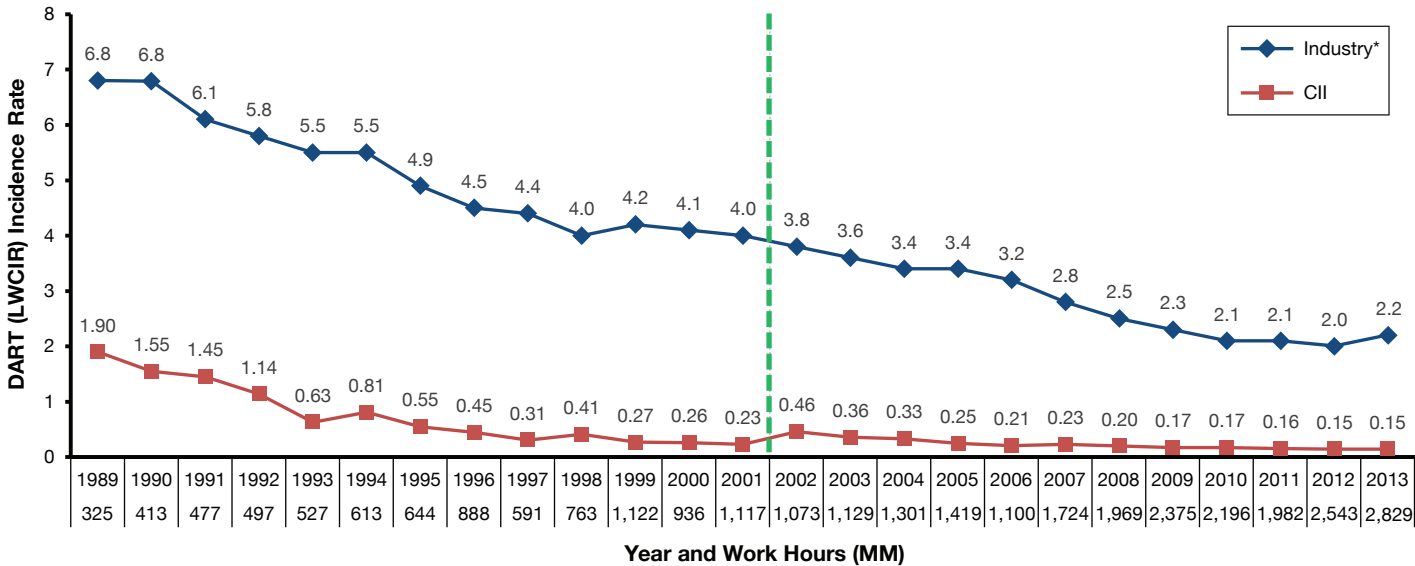
Figures 2 and 3 chronicle the trends of TRIR (known as RIR prior to 2002) and DART (called LWCIR prior to 2002) rates for CII members and for the U.S. construction industry [1] from 1989 to 2012. Notably, both the overall U.S. construction industry and CII members have improved substantially. As before, CII members continue to surpass the U.S. construction industry in safety by a significant margin. That said, in the past few years, the differences in safety rates have narrowed between CII members and the U.S. industry at large. In fact, the U.S. construction industry has continued to progress with regard to safety performance, while the overall safety rates for CII members have changed only slightly.



*OSHA Construction Division, NAICS 236–238 (SIC 15-17)

--- Reflects OSHA reporting change

Figure 2. TRIR (RIR) Rate, Aggregated Data, 1989–2013



*OSHA Construction Division, NAICS 236-238 (SIC 15-17)

--- Reflects OSHA reporting change

Figure 3. DART (LWCIR) Rate, Aggregated Data, 1989–2013

With the changes OSHA made to its record-keeping rules on January 1, 2002, some of the criteria used to determine which injuries and illnesses are recorded have changed. As a result, OSHA suggests that readers should use reasonable caution when comparing data produced under previous regulations with data produced under the new rules. Consequently, since 2003, the CII Annual Safety Report has distinguished the safety data collected before and after the record-keeping rule changes, wherever necessary. For example, in Figures 2 and 3, a dashed green line marks the 2002 OSHA rule changes.

In order to understand the significance of the relatively stable safety performance of CII members in the last few years, CII created control charts presenting the most recent nine years' TRIR and DART rates. (See Figure 4.) The charts indicate that the process appears to be under control as defined by statistical process control (SPC) methods (i.e., all points fall inside the control limits). As Figure 4 illustrates, if all CII members continue managing safety as they now do, they may not ever be able to achieve the goal of zero accidents. Indeed, some fundamental changes are warranted to move the construction industry toward the goal of zero accidents. In order to address such needs, CII has been funding one research project that focuses on using precursor analysis to prevent low-frequency high-impact events, including fatalities (Research Team 321).