2022 CII Safety Summary Report

DPC2022-2

CII Member Companies

Owners

AdvanSix
Air Products
Albemarle Corporation
Anheuser-Busch InBev
Aramco Services Company
Archer Daniels Midland Company
Architect of the Capitol
Ascend Performance Materials
Braskem S.A.
Cargill, Inc.
Chevron
ConocoPhillips
Consolidated Edison Company of New York
Corning Inc.
Covestro LLC
CSL Behring
DTE Energy
DuPont
Eastman Chemical Company
Entergy Corporation
ExxonMobil Corporation
GlaxoSmithKline
Honeywell International Inc.
INEOS Group Holdings S. A.
Irving Oil Limited
Johnson & Johnson
KAFD
Koch Industries, Inc.
Linde Engineering Americas
Los Alamos National Laboratory
LyondellBasell
Ma'aden-Saudi Arabia Mining Co.
Marathon Petroleum Corporation
Naval Facilities Engineering Command
New York Power Authority
NOVA Chemicals Corporation
Nuclear Decommissioning Authority
Nutrien
Occidental Petroleum Corporation
Ontario Power Generation
Petronas
Phillips 66
Public Service Electric & Gas Company
Reliance Industries Limited (RIL)
SABIC - Saudi Basic Industries Corporation
Shell
Sila Nanotechnologies Inc.
Smithsonian Institution
Southern Company
TC Energy
Tennessee Valley Authority
The Dow Chemical Company
The Procter & Gamble Company
U.S. Army Corps of Engineers
U.S. Department of Commerce/NIST
U.S. Department of Energy
U.S. Department of State
U.S. General Services Administration
Vale S.A.
Woodside Energy Limited
Zachry Corporation

Contractors

APTIM
Baker Concrete Construction Inc.
Barton Malow Company
Bechtel Group, Inc.
Black & Veatch
Blanchard Industrial, LLC
Burns & McDonnell
Chiyoda Corporation
CRB
Dematic
Exyte U.S. Inc.
Faithful+Gould
Fluor Corporation
H+M Industrial EPC
Hargrove Engineers + Constructors
Hatch
JGC Corporation
KBR
Kiewit Corporation
Larsen & Toubro Limited
MasTec Power Corporation
Matrix Service Company
McCarthy Building Companies, Inc.
McDermott International, Inc.
Middough Inc.
MODEC Inc.
Orion Plant Service, Inc.
PCL Constructors, Inc.
POWER Engineers, Inc.
Primoris Services Corporation
Richard Industrial Group
Techint Engineering & Construction
Technip Energies
thyssenkrupp Industrial Solutions (USA), Inc.
Toyo Engineering Corporation
United Engineers & Constructors, Inc.
Victaulic
Wood
Worley
Zachry Group

Service Providers

Accenture
Alvarez & Marsal
Autodesk, Inc.
AVEVA Solutions Ltd.
AWP University
Construct-X, LLC
Dassault Systèmes SE
Datum360 Limited
Deloitte
DyCat Solutions
Global Site Solutions
Group ASI
Hilti Corporation
I.M.P.A.C.T.
iConstruct
Insight-AWP Inc.
Kahua, Inc.
Kairos Power, LLC
O3 Solutions
Oracle USA, Inc.
Pathfinder, LLC
PTAG, Inc.
SIRIS LLC
T. A. Cook Consultants Inc.
Valency Inc.
Verum Partners

2022 CII Safety Summary Report

Prepared by
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Deployment Committee

DPC2022-2

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Table of Contents

1

Introduction

CII has collected annual corporate safety performance data from its member organizations since 1990 as part of its long-term commitment to improving safety in the construction industry. This 2022 report summarizes safety rates of 2021 calendar year **reported by CII members only**.

Survey Instrument

The CII safety survey gathers data by organization type, industry group, and project location. The main data entry fields include:

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

In addition, the survey includes questions regarding near misses, first aid cases, and fatalities. All the rates presented in this report follow OSHA's definitions, which are available in the OSHA 300 form[1].

Survey Scope and Potential Limitations

Respondents (both owners and contractors) were asked to provide safety data for both their direct-hire employees and their contractors' employees. However, because contractors were not uniquely identified in the owner responses, some double reporting of contractor data is possible. This overlap often presents itself in the following two ways:

- Owners reporting on their contractors' employees
- Contractors reporting on their direct-hire employees

[1] https://www.osha.gov/recordkeeping/RKforms.html

Readers should use caution when comparing results across different industry groups, since **some groups have relatively small sample sizes** (reflected in the number of companies and work hours associated with each group reported in the charts).

CII uses definitions for its industry groups that differ from both the system OSHA currently uses – the 2002 North American Industrial Classification System (NAICS) – and the Standard Industrial Classification (SIC) system that OSHA used prior to 2003. The construction industry divisions of the NAICS and the SIC system consist of three major groups:

1. General Building (NAICS 236 and SIC 15)
2. Heavy Construction except for Buildings (NAICS 237 and SIC 16)
3. Special Trade Contractors (NAICS 238 and SIC 17)

CII data do not include residential construction, which is included in OSHA's "General Building" category.

CII collects safety data related (only) to capital projects, excluding operations and maintenance. This is particularly important for owners reporting their safety data.

2

Summary of 2021 Safety Data

For the 2021 calendar year, 51 organizations submitted their corporate safety statistics. These data represent a total of 1.02 billion work hours. Figure 1 summarizes the reported work hours by organization type and project location. The Global responses are those that did not break down the data into U.S. and international hours. Table 1 below summarizes the data by severity of incidents.

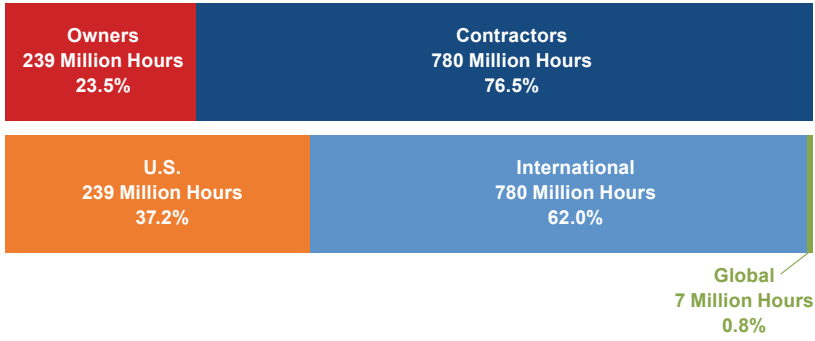

Figure 1. Summary of Work Hours
by Organization Type and Project Location

Table 1. Summary of Incident Cases and Work Hours
by Organization Type

		Owners	Contractors	Total
TRIR	*Cases*	399	1,002	**1,401**
	Work Hours	239,451,295	780,302,116	**1,019,753,411**
DART Rate	*Cases*	122	397	**519**
	Work Hours	221,192,647	780,302,116	**1,001,494,763**
Fatality Rate	*Cases*	1	4	**5**
	Work Hours	239,451,295	780,302,116	**1,019,753,411**

Some respondents did not provide all of the requested data or details for all categories. For instance, an organization may report the total recordable incidents but not report the DART cases, in which case the aggregated amount of work hours for DART cases will be smaller. For this reason, the total overall work hours reported differs from many of the categories presented in Table 1. In particular, some owners had difficulty reporting information related to RT cases due to short durations of the work tasks involved.

3

Historical TRIR and DART Rates

Table 2 shows the TRIR and DART rates of CII member organizations from 2017 to 2021.

Table 2. CII Members' TRIR and DART Rates (2017-2021)

	2017	2018	2019	2020	2021
TRIR	0.22	0.39	0.22	0.28	0.27
DART Rate	0.09	0.10	0.09	0.12	0.10

On the following pages, Figures 2 and 3 show the trends of CII members' TRIR and DART rates and work hours for survey respondents as well as for the U.S. construction industry as reported by OSHA. The CII rates have been relatively low and steady since 2016.

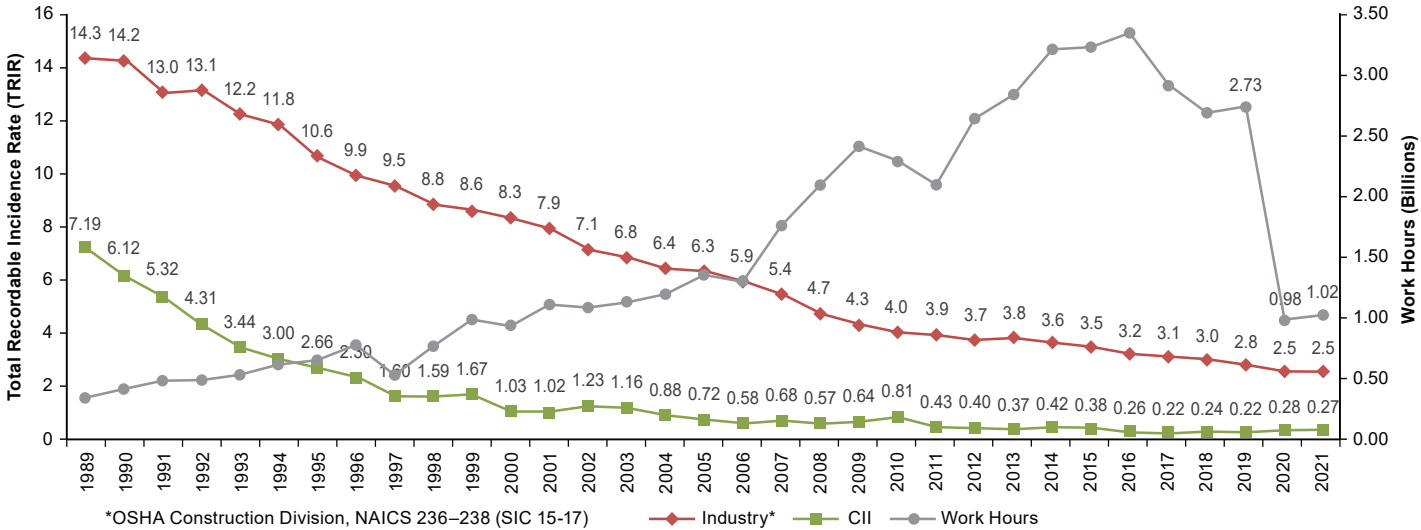

Figure 2. CII Members' Reported TRIR (RIR) Rates, 1989-2021

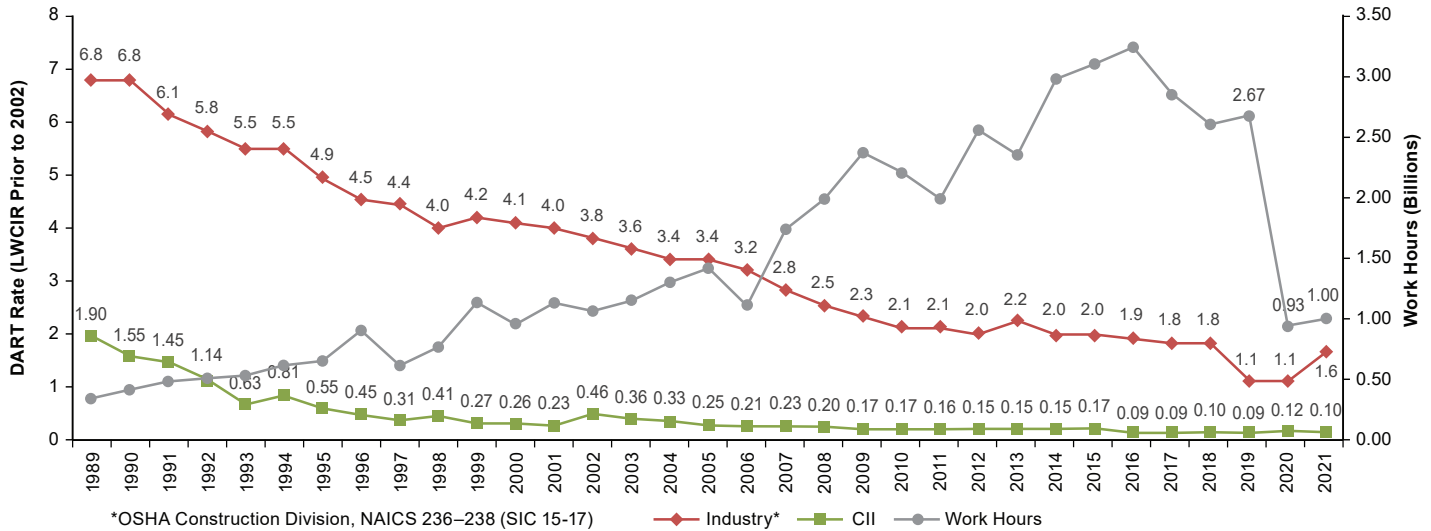

Figure 3. CII Members' Reported DART (LWCIR) Rates, 1989-2021

4

Safety Data and Rates by Industry Group

The safety survey collects data from four industry groups: Heavy Industrial, Light Industrial, Buildings, and Infrastructure. The figures below summarize the TRIR (Figure 4) and DART (Figure 5) rates for each group and by respondent type. The N values indicate the number of companies that submitted data, and the "Total" (green) bars represent the combined data from owners and contractors.

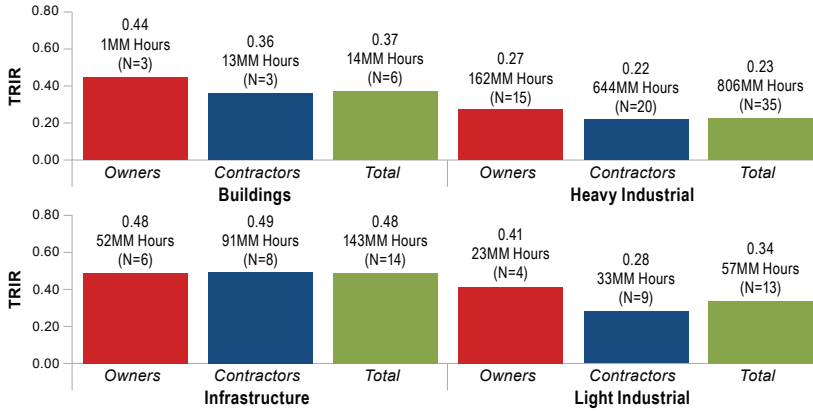

Figure 4. 2021 TRIR by Industry Group

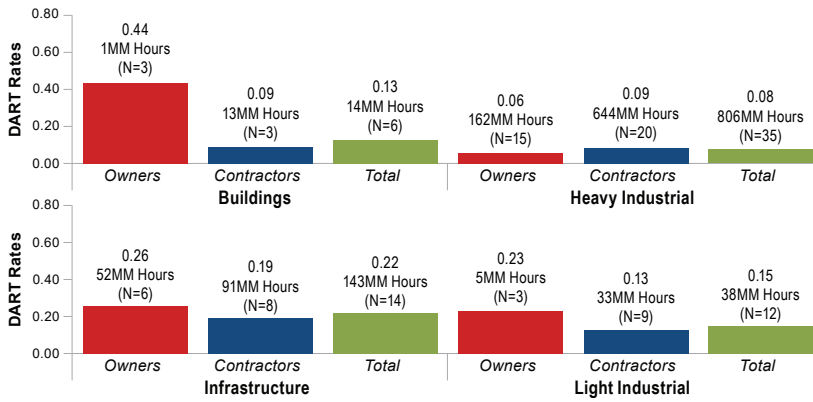

Figure 5. 2021 DART Rates by Industry Group

5

Safety Data and Rates by Project Location

Survey respondents are involved in capital projects around the world. This chapter summarizes data from U.S. and non-U.S. projects. Note that, ideally, the non-U.S. data would be further broken down by geographic region, but most regions offered limited data. Therefore, this report aggregated all non-U.S. data into one group. As shown in Figures 6 and 7, the N values indicate the number of companies that submitted data, and the "Total" (green) bars represent the combined data from owners and contractors.

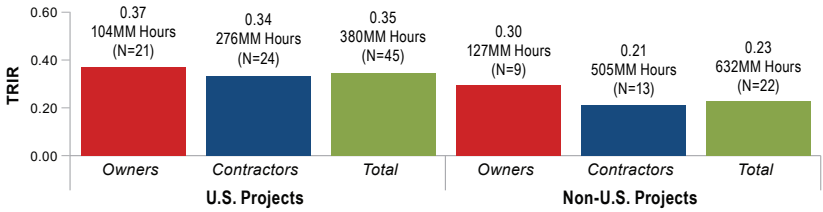

Figure 6. 2021 TRIR by Project Location

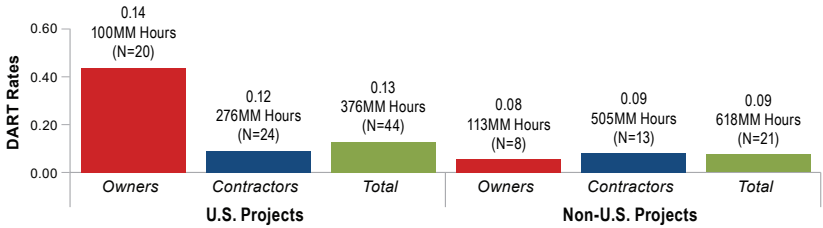

Figure 7. 2021 DART Rates by Project Location

6

Fatalities

As shown in Figure 8, the overall fatality rate of CII members dropped in 2021 to 0.99 from the 1.43 reported in 2020. The three-year moving average for 2019 to 2021 is 1.27. For reference, the overall industry fatality rate was 9.4 in 2021 as per the Bureau of Labor Statistics[2].

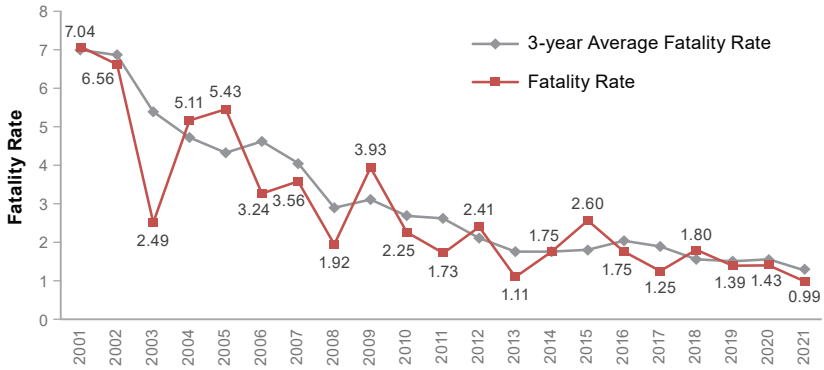

Figure 8. Yearly and Three-year Average Fatality Rates (2001–2021)

In 2021, CII members reported five fatalities. Figure 9 shows that the cause in all five cases was Contact with Objects and Equipment. No fatalities were reported in other categories.

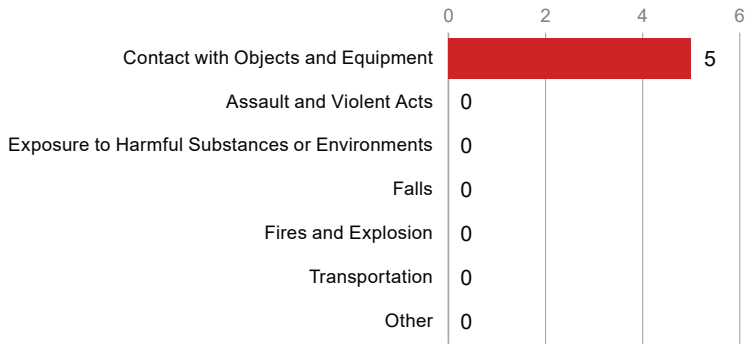

Figure 9. Fatality Causes in 2021

[2] https://www.bls.gov/iif/home.htm

7

Corporate Safety Benchmarks

This chapter uses individual organizations' safety rates to analyze the safety data. The information presented in this section allows organizations to determine more precisely where they stand relative to other organizations, as organizations can benchmark their corporate safety performance against others.

On the next page, Table 4 presents 2021 corporate-level descriptive statistics, including percentile, mean, standard deviation (S.D.), and sample size (n) based on TRIR, DART, DA (Days Away), and Fatality Rate of individual companies. For instance, if an organization had a TRIR of 0.45 in 2021, its safety performance would fall in the third quartile, between 0.27 and 0.54. This means that the organization's TRIR is worse than at least 50% of the responding organizations but better than at least 25% of them.

Table 4. 2021 Corporate Safety Statistics for Benchmarking

	All				Owners				Contractors			
Percentile	TRIR	DART Rate	DA Rate	Fatality Rate	TRIR	DART Rate	DA Rate	Fatality Rate	TRIR	DART Rate	DA Rate	Fatality Rate
100th	1.80	1.17	0.65	5.98	1.01	0.65	0.65	5.98	1.80	1.17	0.54	5.31
75th	0.54	0.17	0.08	0.00	0.60	0.17	0.08	0.00	0.44	0.22	0.07	0.00
50th	0.27	0.06	0.01	0.00	0.36	0.08	0.00	0.00	0.19	0.07	0.02	0.00
25th	0.09	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.09	0.02	0.00	0.00
0th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	0.37	0.16	0.08	0.26	0.38	0.14	0.08	0.24	0.37	0.18	0.07	0.29
S.D.	0.39	0.25	0.14	1.13	0.27	0.19	0.15	1.17	0.48	0.29	0.14	1.09
n	51	50	50	51	25	24	25	25	24	24	24	24

Figures 10 through 12 show percentile charts for organizations' TRIR, DART rate, and DA rate. For example, if a contractor had an overall corporate TRIR rate of 0.40, Figure 10 indicates that approximately 70% of contractors participating in the survey achieved a better TRIR.

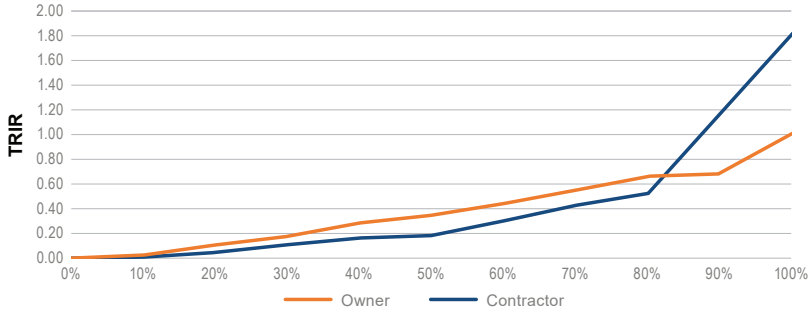

Figure 10. Corporate Safety Statistics – TRIR

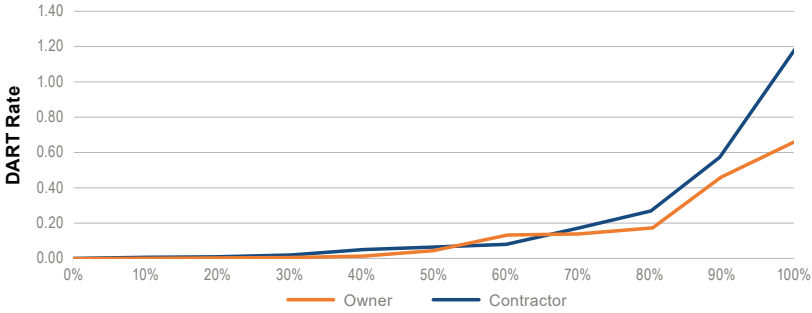

Figure 11. Corporate Safety Statistics – DART Rate

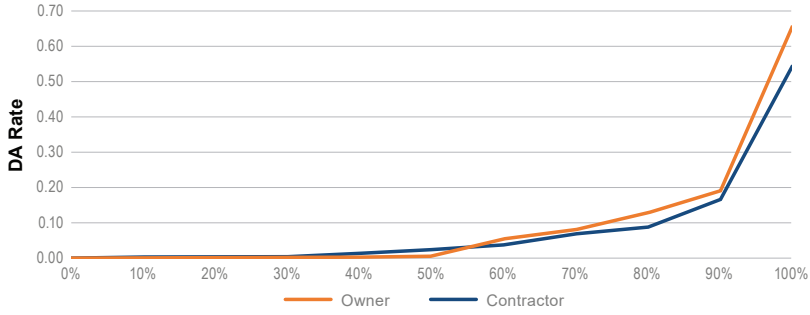

Figure 12. Corporate Safety Statistics – DA Rate

Appendix

Glossary of Terms

DA Days Away – The DA rate is the number of DA cases occurring annually among 100 full-time workers (i.e., 2,000 hours per worker per year).

$$\text{DA Rate} = \frac{(\text{\# of DA Cases}) \times 200{,}000}{(\text{Total Work Hours by All Employees})}$$

DART Days Away and Restricted or Transferred – The DART rate represents the number of DART cases occurring annually among 100 full-time workers (i.e., 2,000 hours per worker per year). DART replaced LWCIR in 2002.

$$\text{DART Rate} = \frac{(\text{\# of DART Cases}) \times 200{,}000}{(\text{Total Work Hours by All Employees})}$$

FR Fatality Rate – The FR is the number of fatal work injuries occurring annually among 100,000 full-time workers (i.e., each worker works 40 hours per week for 50 weeks per year, or 200,000,000 hours per year for 100,000 full-time workers).

$$\text{Fatality Rate} = \frac{(\text{\# of Fatalities}) \times 200{,}000{,}000}{(\text{Total Work Hours by All Employees})}$$

LWCIR Lost Workday Case Incident Rate – Replaced by DART in 2002.

RIR Recordable Incident Rate – Replaced by TRIR in 2002.

TRIR Total Recordable Incident Rate – TRIR is the number of recordable injuries occurring annually among 100 full-time workers (i.e., 2,000 hours per worker per year). TRIR replaced RIR in 2002.

$$\text{TRIR} = \frac{(\text{\# of Recordable Cases}) \times 200{,}000}{(\text{Total Work Hours by All Employees})}$$

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