UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

(Mark One)

☑ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended March 31, 2020
OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from __________ to __________
Commission file number: 1-6003

FEDERAL SIGNAL CORPORATION
(Exact name of registrant as specified in its charter)

Delaware	**36-1063330**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*

1415 West 22nd Street, Oak Brook, Illinois
(Address of principal executive offices)

60523
(Zip code)

(630) 954-2000
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $1.00 per share	FSS	New York Stock Exchange

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☑	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
Emerging growth company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☑

As of March 31, 2020, the number of shares outstanding of the registrant's common stock was 60,242,620.

FEDERAL SIGNAL CORPORATION

TABLE OF CONTENTS

FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-Q ("Form 10-Q") is being filed by Federal Signal Corporation and its subsidiaries (referred to collectively as the "Company," "we," "our" or "us" herein, unless the context otherwise indicates) with the United States ("U.S.") Securities and Exchange Commission (the "SEC"), and includes comments made by management that may contain words such as "may," "will," "believe," "expect," "anticipate," "intend," "plan," "project," "estimate" and "objective" or similar terminology, or the negative thereof, concerning the Company's future financial performance, business strategy, plans, goals and objectives. These expressions are intended to identify forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the Private Securities Litigation Reform Act of 1995. Forward-looking statements include information concerning the Company's possible or assumed future performance or results of operations and are not guarantees. While these statements are based on assumptions and judgments that management has made in light of industry experience as well as perceptions of historical trends, current conditions, expected future developments and other factors believed to be appropriate under the circumstances, they are subject to risks, uncertainties and other factors that may cause the Company's actual results, performance or achievements to be materially different.

These risks and uncertainties, some of which are beyond the Company's control, include the risk factors described under Part I, Item 1A, *Risk Factors*, of the Company's Annual Report on Form 10-K for the year ended December 31, 2019, which was filed with the SEC on February 27, 2020, and as updated in Part II, Item 1A, *Risk Factors* of this Form 10-Q. These factors may not constitute all factors that could cause actual results to differ materially from those discussed in any forward-looking statement. The Company operates in a continually changing business environment and new factors emerge from time to time, including, for example, the recent coronavirus ("COVID-19") pandemic and the government response to the pandemic. The Company cannot predict such factors, nor can it assess the impact, if any, of such factors on its results of operations, financial condition or cash flow. Accordingly, forward-looking statements should not be relied upon as a predictor of actual results. The Company disclaims any responsibility to update any forward-looking statement provided in this Form 10-Q.

ADDITIONAL INFORMATION

The Company is subject to the reporting and information requirements of the Exchange Act and, as a result, is obligated to file Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and other reports and information with the SEC, as well as amendments to those reports. The Company makes these filings available free of charge through our website at www.federalsignal.com as soon as reasonably practicable after such materials are filed with, or furnished to, the SEC. Information on our website does not constitute part of this Form 10-Q.

PART I. FINANCIAL INFORMATION

Item 1. ***Financial Statements (Unaudited).***

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS (Unaudited)

(in millions, except per share data)	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Net sales	$ 286.1	$ 273.8
Cost of sales	211.3	203.5
Gross profit	74.8	70.3
Selling, engineering, general and administrative expenses	42.2	43.9
Acquisition and integration-related expenses	0.3	0.6
Operating income	32.3	25.8
Interest expense	1.5	2.0
Other expense, net	0.2	0.4
Income before income taxes	30.6	23.4
Income tax expense	7.2	5.9
Net income	$ 23.4	$ 17.5
Earnings per share:		
Basic	$ 0.39	$ 0.29
Diluted	0.38	0.29
Weighted average common shares outstanding:		
Basic	60.5	60.1
Diluted	61.7	61.2

See notes to condensed consolidated financial statements.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (Unaudited)

(in millions)	Three Months Ended March 31, 2020	2019
Net income	$ 23.4	$ 17.5
Other comprehensive (loss) income:		
Change in foreign currency translation adjustment	(6.1)	—
Change in unrecognized net actuarial loss and prior service cost related to pension benefit plans, net of income tax expense of $0.2 and $0.2, respectively	1.8	0.2
Change in unrealized gain or loss on interest rate swaps, net of income tax benefit of $(1.0) and $(0.2), respectively	(3.1)	(0.5)
Total other comprehensive loss	(7.4)	(0.3)
Comprehensive income	$ 16.0	$ 17.2

See notes to condensed consolidated financial statements.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED BALANCE SHEETS

(in millions, except per share data)	March 31, 2020 (Unaudited)	December 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 69.4	$ 31.6
Accounts receivable, net of allowances for doubtful accounts of $2.3 and $2.4, respectively	141.4	134.2
Inventories	201.4	182.9
Prepaid expenses and other current assets	10.7	12.0
Total current assets	422.9	360.7
Properties and equipment, net of accumulated depreciation of $127.5 and $125.5, respectively	98.1	91.9
Rental equipment, net of accumulated depreciation of $34.6 and $33.6, respectively	115.9	115.4
Operating lease right-of-use assets	25.8	27.6
Goodwill	387.9	388.8
Intangible assets, net of accumulated amortization of $24.5 and $22.1, respectively	159.8	162.9
Deferred tax assets	9.2	10.0
Deferred charges and other long-term assets	7.2	7.9
Long-term assets of discontinued operations	0.3	0.3
Total assets	$ 1,227.1	$ 1,165.5
LIABILITIES AND STOCKHOLDERS’ EQUITY		
Current liabilities:		
Current portion of long-term borrowings and finance lease obligations	$ 0.2	$ 0.2
Accounts payable	78.0	65.0
Customer deposits	15.6	11.5
Accrued liabilities:		
Compensation and withholding taxes	23.0	31.1
Other current liabilities	50.1	52.2
Current liabilities of discontinued operations	0.2	0.2
Total current liabilities	167.1	160.2
Long-term borrowings and finance lease obligations	278.7	220.3
Long-term operating lease liabilities	19.8	21.6
Long-term pension and other postretirement benefit liabilities	48.9	50.9
Deferred tax liabilities	54.3	52.7
Other long-term liabilities	21.2	17.3
Long-term liabilities of discontinued operations	0.9	0.9
Total liabilities	590.9	523.9
Stockholders’ equity:		
Common stock, $1 par value per share, 90.0 shares authorized, 67.2 and 66.9 shares issued, respectively	67.2	66.9
Capital in excess of par value	230.1	228.6
Retained earnings	546.8	528.2
Treasury stock, at cost, 7.0 and 6.4 shares, respectively	(111.4)	(93.0)
Accumulated other comprehensive loss	(96.5)	(89.1)
Total stockholders’ equity	636.2	641.6
Total liabilities and stockholders’ equity	$ 1,227.1	$ 1,165.5

See notes to condensed consolidated financial statements.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS (Unaudited)

(in millions)	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Operating activities:		
Net income	$ 23.4	$ 17.5
Adjustments to reconcile net income to net cash provided by (used for) operating activities:		
Net gain on sales of properties and equipment	(0.2)	—
Depreciation and amortization	10.8	9.5
Deferred financing costs	0.1	0.1
Stock-based compensation expense	1.0	1.4
Pension (benefit) expense, net of funding	(0.4)	(0.1)
Changes in fair value of contingent consideration and deferred payment	—	0.3
Deferred income taxes	2.8	1.2
Changes in operating assets and liabilities	(32.3)	(38.7)
Net cash provided by (used for) operating activities	5.2	(8.8)
Investing activities:		
Purchases of properties and equipment	(9.5)	(4.5)
Proceeds from sales of properties and equipment	0.3	—
Proceeds from acquisition-related activity	0.8	—
Net cash used for investing activities	(8.4)	(4.5)
Financing activities:		
Increase in revolving lines of credit, net	63.6	5.5
Purchases of treasury stock	(13.5)	(1.0)
Redemptions of common stock to satisfy withholding taxes related to stock-based compensation	(4.0)	(1.1)
Cash dividends paid to stockholders	(4.8)	(4.8)
Other, net	0.1	—
Net cash provided by (used for) financing activities	41.4	(1.4)
Effects of foreign exchange rate changes on cash and cash equivalents	(0.4)	—
Increase (decrease) in cash and cash equivalents	37.8	(14.7)
Cash and cash equivalents at beginning of year	31.6	37.4
Cash and cash equivalents at end of period	$ 69.4	$ 22.7

See notes to condensed consolidated financial statements.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY (Unaudited)

	Three Months Ended March 31, 2020					
(in millions)	Common Stock	Capital in Excess of Par Value	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Total
Balance at January 1, 2020	$ 66.9	$ 228.6	$ 528.2	$ (93.0)	$ (89.1)	$ 641.6
Net income			23.4			23.4
Total other comprehensive loss					(7.4)	(7.4)
Cash dividends declared ($0.08 per share)			(4.8)			(4.8)
Stock-based payments:						
Stock-based compensation		1.0				1.0
Stock option exercises and other	0.1	0.7		(2.0)		(1.2)
Performance share unit transactions	0.2	(0.2)		(2.9)		(2.9)
Stock repurchase program				(13.5)		(13.5)
Balance at March 31, 2020	$ 67.2	$ 230.1	$ 546.8	$ (111.4)	$ (96.5)	$ 636.2

	Three Months Ended March 31, 2019					
(in millions)	Common Stock	Capital in Excess of Par Value	Retained Earnings	Treasury Stock	Accumulated Other Comprehensive Loss	Total
Balance at January 1, 2019	$ 66.4	$ 217.0	$ 432.5	$ (88.5)	$ (97.3)	$ 530.1
Net income			17.5			17.5
Total other comprehensive loss					(0.3)	(0.3)
Cash dividends declared ($0.08 per share)			(4.8)			(4.8)
Impact of adoption of ASU 2016-02			6.5			6.5
Stock-based payments:						
Stock-based compensation		1.4				1.4
Stock option exercises and other	—	0.1		(0.2)		(0.1)
Performance share unit transactions	0.1	(0.1)		(0.9)		(0.9)
Stock repurchase program				(1.0)		(1.0)
Balance at March 31, 2019	$ 66.5	$ 218.4	$ 451.7	$ (90.6)	$ (97.6)	$ 548.4

See notes to condensed consolidated financial statements.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

NOTE 1 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Organization and Description of the Business

Federal Signal Corporation was founded in 1901 and was reincorporated as a Delaware corporation in 1969. References herein to the "Company," "we," "our" or "us" refer collectively to Federal Signal Corporation and its subsidiaries.

Products manufactured and services rendered by the Company are divided into two reportable segments: Environmental Solutions Group and Safety and Security Systems Group. The individual operating businesses are organized as such because they share certain characteristics, including technology, marketing, distribution and product application, which create long-term synergies. These segments are discussed in Note 10 – Segment Information.

Basis of Presentation and Consolidation

The accompanying unaudited condensed consolidated financial statements represent the consolidation of Federal Signal Corporation and its subsidiaries included herein and have been prepared by the Company pursuant to the rules and regulations of the United States ("U.S.") Securities and Exchange Commission (the "SEC"). Certain information and footnote disclosures normally included in financial statements prepared in accordance with U.S. generally accepted accounting principles ("GAAP") have been condensed or omitted pursuant to such rules and regulations, although the Company believes that the disclosures presented herein are adequate to ensure the information presented is not misleading. Except as otherwise noted, these condensed consolidated financial statements have been prepared in accordance with the Company's accounting policies described in the Company's Annual Report on Form 10-K for the year ended December 31, 2019, and should be read in conjunction with those consolidated financial statements and the notes thereto.

These condensed consolidated financial statements include all normal and recurring adjustments that we considered necessary to present a fair statement of our results of operations, financial condition and cash flow. Intercompany balances and transactions have been eliminated in consolidation.

The results reported in these condensed consolidated financial statements should not be regarded as necessarily indicative of results that may be expected for the entire year, which may differ materially due to, among other things, the risk factors described under Part I, Item 1A, *Risk Factors*, of the Company's Annual Report on Form 10-K for the year ended December 31, 2019, which was filed with the SEC on February 29, 2020, and as updated in Part II, Item 1A, *Risk Factors*, in this Form 10-Q. While we label our quarterly information using a calendar convention whereby our first, second and third quarters are labeled as ending on March 31, June 30 and September 30, respectively, it is our longstanding practice to establish interim quarterly closing dates based on a 13-week period ending on a Saturday, with our fiscal year ending on December 31. The effects of this practice are not material and exist only within a reporting year.

Recent Accounting Pronouncements and Accounting Changes

In June 2016, the Financial Accounting Standards Board (the "FASB") issued Accounting Standards Update ("ASU") No. 2016-13, *Financial Instruments – Credit Losses (Topic 326), Measurement of Credit Losses on Financial Statements*, which requires the measurement of expected credit losses for financial instruments based on historical experience, current conditions, and reasonable forecasts. The amendments in this ASU are effective for fiscal years beginning after December 15, 2019 and interim periods within those fiscal years. The amendments in this ASU should be applied on a modified retrospective basis. The Company adopted this guidance effective January 1, 2020. The adoption of this ASU did not have a material impact on the Company's consolidated financial statements.

In August 2018, the FASB issued ASU No. 2018-13, *Fair Value Measurement (Topic 820)*, which eliminates certain disclosure requirements, such as the amount of, and reasons for, transfers between Level 1 and Level 2 of the fair value hierarchy. This ASU adds new disclosure requirements for Level 3 measurements, and is effective for fiscal years beginning after December 15, 2019 and interim periods within those fiscal years. The Company adopted this guidance effective January 1, 2020. The adoption of this ASU did not have a material impact on the Company's disclosures in its consolidated financial statements.

In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740), Simplifying the Accounting for Income Taxes*, which is intended to simplify various aspects related to accounting for income taxes. ASU 2019-12 removes certain exceptions to the general principles in Topic 740 and also clarifies and amends existing guidance to improve consistent application. The amendments in this ASU are effective for fiscal years beginning after December 15, 2020 and interim periods within those fiscal years. Early adoption is permitted. The amendments in this ASU should be applied on a retrospective, modified retrospective or prospective basis, depending on the area covered by the update. The Company currently expects to adopt this guidance effective January 1, 2021 and does not expect that its adoption will have a material impact on the Company's consolidated financial statements.

In March 2020, the FASB issued ASU No. 2020-04, *Reference Rate Reform (Topic 848), Facilitation of the Effects of Reference Rate Reform on Financial Reporting*, which provides temporary optional expedients and exceptions for applying U.S. GAAP to contracts, hedging relationships, and other transactions that reference LIBOR or another reference rate expected to be discontinued because of reference rate reform. Among other things, for all types of hedging relationships, the guidance allows an entity to change the reference rate and other critical terms related to reference rate reform without having to remeasure the value or reassess a previous accounting determination. The amendments in this guidance should be applied on a prospective basis and, for companies with a fiscal year ending December 31, are effective from January 1, 2020 through December 31, 2022. The Company adopted this guidance effective January 1, 2020. When the transition occurs, the Company expects to apply this expedient to its existing interest rate swap that references LIBOR, and to any other new transactions that reference LIBOR or another reference rate that is discontinued, through December 31, 2022. The adoption of this ASU did not have any impact on the Company's consolidated financial statements.

No other new accounting pronouncements issued, but not yet adopted, are expected to have a material impact on the Company's results of operations, financial position or cash flow.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect (i) the reported amounts of assets and liabilities, (ii) the disclosure of contingent assets and liabilities at the date of the consolidated financial statements and (iii) the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Significant Accounting Policies

There have been no changes to the Company's significant accounting policies as disclosed in the Company's Annual Report on Form 10-K for the year ended December 31, 2019.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS — (CONTINUED)
(Unaudited)

NOTE 2 – REVENUE RECOGNITION

The following table presents the Company's Net sales disaggregated by geographic region, based on the location of the end customer, and by major product line:

	Three Months Ended March 31,	
(in millions)	**2020**	**2019**
Geographic Region:		
U.S.	$ 226.6	$ 204.8
Canada	33.5	44.4
Europe/Other	26.0	24.6
Total net sales	$ 286.1	$ 273.8
Major Product Line:		
Environmental Solutions		
Vehicles and equipment [(a)]	$ 186.1	$ 173.7
Parts	33.4	31.1
Rental income [(b)]	8.8	9.6
Other [(c)]	4.7	5.1
Total	233.0	219.5
Safety and Security Systems		
Public safety and security equipment	31.8	32.4
Industrial signaling equipment	14.3	13.8
Warning systems	7.0	8.1
Total	53.1	54.3
Total net sales	$ 286.1	$ 273.8

(a) Includes net sales from the sale of new and used vehicles and equipment, including sales of rental equipment.
(b) Represents income from vehicle and equipment lease arrangements with customers.
(c) Primarily includes revenues from services, such as maintenance and repair work, and the sale of extended warranty contracts.

Contract Balances

The Company recognizes contract liabilities when cash payments, such as customer deposits, are received in advance of the Company's satisfaction of the related performance obligations. Contract liabilities are recognized as Net sales when the related performance obligations are satisfied, which generally occurs within three to six months of the cash receipt. Contract liability balances are not materially impacted by any other factors. The Company's contract liabilities were $18.4 million and $13.9 million as of March 31, 2020 and December 31, 2019, respectively. Contract assets, such as unbilled receivables, were not material as of any of the periods presented herein.

NOTE 3 – INVENTORIES

The following table summarizes the components of Inventories:

(in millions)	**March 31, 2020**	**December 31, 2019**
Finished goods	$ 93.7	$ 86.8
Raw materials	86.6	79.5
Work in process	21.1	16.6
Total inventories	$ 201.4	$ 182.9

NOTE 4 – DEBT

The following table summarizes the components of Long-term borrowings and finance lease obligations:

(in millions)	March 31, 2020	December 31, 2019
2019 Credit Agreement [(a)]	$ 278.2	$ 219.9
Finance lease obligations	0.7	0.6
Total long-term borrowings and finance lease obligations, including current portion	278.9	220.5
Less: Current finance lease obligations	0.2	0.2
Total long-term borrowings and finance lease obligations	$ 278.7	$ 220.3

(a) Defined as the Second Amended and Restated Credit Agreement, dated July 30, 2019.

As more fully described within Note 11 – Fair Value Measurements, the Company uses a three-level fair value hierarchy that prioritizes the inputs used to measure fair value. The fair value of long-term debt is based on interest rates that we believe are currently available to us for issuance of debt with similar terms and remaining maturities (Level 2 input).

The following table summarizes the carrying amounts and estimated fair values of the Company's long-term borrowings:

	March 31, 2020		December 31, 2019	
(in millions)	Notional Amount	Fair Value	Notional Amount	Fair Value
Long-term borrowings [(a)]	$ 278.9	$ 278.9	$ 220.5	$ 220.5

(a) Long-term borrowings includes current finance lease obligations of $0.2 million and $0.2 million as of March 31, 2020 and December 31, 2019, respectively.

Borrowings under the 2019 Credit Agreement bear interest, at the Company's option, at a base rate or a LIBOR rate, plus, in each case, an applicable margin. The applicable margin ranges from zero to 0.75% for base rate borrowings and 1.00% to 1.75% for LIBOR borrowings. The Company must also pay a commitment fee to the lenders ranging between 0.10% to 0.25% per annum on the unused portion of the $500 million revolving credit facility along with other standard fees. Letter of credit fees are payable on outstanding letters of credit in an amount equal to the applicable LIBOR margin plus other customary fees.

The Company is subject to certain net leverage ratio and interest coverage ratio financial covenants under the 2019 Credit Agreement that are to be measured at each fiscal quarter-end. The Company was in compliance with all such covenants as of March 31, 2020.

As of March 31, 2020, there was $278.2 million of cash drawn and $11.2 million of undrawn letters of credit under the 2019 Credit Agreement, with $210.6 million of availability for borrowings. As of December 31, 2019, there was $219.9 million cash drawn and $11.2 million of undrawn letters of credit under the 2019 Credit Agreement, with $268.9 million of availability for borrowings.

The following table summarizes the gross borrowings and gross payments under the Company's revolving credit facilities:

	Three Months Ended March 31,	
(in millions)	2020	2019
Gross borrowings	$ 81.1	$ 7.0
Gross payments	17.5	1.5

Interest Rate Swap

On June 2, 2017, the Company entered into an interest rate swap (the "2017 Swap") with a notional amount of $150.0 million, as a means of fixing the floating interest rate component on $150.0 million of its variable-rate debt. In the third quarter of 2019, the Company terminated the 2017 Swap and received $0.2 million in connection with its settlement. The 2017 Swap was previously designated as a cash flow hedge, with an original termination date of June 2, 2020.

On October 2, 2019, the Company entered into an interest rate swap (the "2019 Swap") with a notional amount of $75.0 million, as a means of fixing the floating interest rate component on $75.0 million of its variable-rate debt. The 2019 Swap is designated as a cash flow hedge, with a maturity date of July 30, 2024.

As a result of the application of hedge accounting treatment, all unrealized gains and losses related to the derivative instrument are recorded in Accumulated other comprehensive loss and are reclassified into operations in the same period in which the hedged transaction affects earnings. The gain on the termination of the 2017 Swap has been included in Accumulated other comprehensive loss and will be reclassified into earnings ratably through June 2, 2020. Hedge effectiveness is assessed quarterly. The Company does not use derivative instruments for trading or speculative purposes.

The fair value of the Company's interest rate swaps is derived from a discounted cash flow analysis based on the terms of the contract and the interest rate curve (Level 2 inputs) and measured on a recurring basis in our Condensed Consolidated Balance Sheets. At March 31, 2020, the fair value of the 2019 Swap was a liability of $3.1 million, which was included in Other long-term liabilities on the Condensed Consolidated Balance Sheet. At December 31, 2019, the fair value of the 2019 Swap was an asset of $0.9 million, which was included in Deferred charges and other long-term assets on the Condensed Consolidated Balance Sheet. During the three months ended March 31, 2020 and 2019, unrealized pre-tax losses of $4.0 million and $0.6 million, respectively, were recorded in Accumulated other comprehensive loss, and no ineffectiveness was recorded.

NOTE 5 – INCOME TAXES

The Company recognized income tax expense of $7.2 million and $5.9 million for the three months ended March 31, 2020 and 2019, respectively. The increase in tax expense in the current-year quarter was largely due to higher pre-tax income levels, partially offset by the recognition of a $0.7 million excess tax benefit from stock compensation activity. The Company's effective tax rate for the three months ended March 31, 2020 was 23.5%, compared to 25.2% in the prior-year quarter.

On March 27, 2020, the Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act") was enacted. The income tax provisions of the CARES Act had limited applicability to the Company as of March 31, 2020, and therefore, the enactment of the CARES Act did not have a material impact on the Company's consolidated financial statements as of, and for the three months ended, March 31, 2020.

NOTE 6 – PENSIONS

The following table summarizes the components of net periodic pension (benefit) expense:

	U.S. Benefit Plan		Non-U.S. Benefit Plan	
	Three Months Ended March 31,		Three Months Ended March 31,	
(in millions)	**2020**	**2019**	**2020**	**2019**
Service cost	$ —	$ —	$ 0.1	$ 0.1
Interest cost	1.4	1.7	0.3	0.3
Amortization of actuarial loss	0.8	0.6	0.1	0.2
Expected return on plan assets	(2.3)	(2.2)	(0.5)	(0.5)
Net periodic pension (benefit) expense	$ (0.1)	$ 0.1	$ —	$ 0.1

The items that comprise Net periodic pension (benefit) expense, other than service cost, are included as a component of Other expense, net on the Condensed Consolidated Statements of Operations.

NOTE 7 – COMMITMENTS AND CONTINGENCIES

Financial Commitments

The Company provides indemnifications and other guarantees in the ordinary course of business, the terms of which range in duration and often are not explicitly defined. Specifically, the Company is occasionally required to provide letters of credit and bid and performance bonds to various customers, principally to act as security for retention levels related to casualty insurance policies and to guarantee the performance of subsidiaries that engage in export and domestic transactions. At March 31, 2020, the Company had outstanding performance and financial standby letters of credit, as well as outstanding bid and performance bonds, aggregating to $23.5 million. If any such letters of credit or bonds are called, the Company would be obligated to reimburse the issuer of the letter of credit or bond. The Company believes the likelihood of any currently outstanding letter of credit or bond being called is remote.

The Company has transactions involving the sale of equipment to certain of its customers which include (i) guarantees to repurchase the equipment for a fixed price at a future date and (ii) guarantees to repurchase the equipment from the third-party lender in the event of default by the customer. As of March 31, 2020, the single year and maximum potential cash payments the Company could be required to make to repurchase equipment under these agreements were $3.5 million and $3.7 million, respectively. The Company's risk under these repurchase arrangements would be partially mitigated by the value of the products repurchased as part of the transaction. Historical cash requirements and losses associated with these obligations have not been significant, but could increase if customer defaults exceed current expectations, including as a result of the current COVID-19 pandemic and its effect on the global economy.

Product Warranties

The Company issues product performance warranties to customers with the sale of its products. The specific terms and conditions of these warranties vary depending upon the product sold and country in which the Company does business, with warranty periods generally ranging from one to five years. The Company estimates the costs that may be incurred under its basic limited warranty and records a liability in the amount of such costs at the time the sale of the related product is recognized. Factors that affect the Company's warranty liability include (i) the number of units under warranty, (ii) historical and anticipated rates of warranty claims and (iii) costs per claim. The Company periodically assesses the adequacy of its recorded warranty liabilities and adjusts the amounts as necessary.

The following table summarizes the changes in the Company's warranty liabilities during the three months ended March 31, 2020 and 2019:

(in millions)	2020	2019
Balance at January 1	$ 11.2	$ 9.8
Provisions to expense	1.6	1.3
Payments	(1.8)	(1.5)
Balance at March 31	$ 11.0	$ 9.6

As of March 31, 2020 and December 31, 2019, an estimated liability was recorded within the Environmental Solutions Group in connection with a specific warranty matter. It is reasonably possible that the Company's estimate may change in the future as more information becomes available; however, the ultimate resolution of this matter is not expected to have a material adverse effect on the Company's results of operations, financial position or liquidity.

Liabilities of Discontinued Operations

The Company retains certain liabilities for operations discontinued in prior periods, primarily for environmental remediation and product liability. Included in liabilities of discontinued operations on the Condensed Consolidated Balance Sheets as of both March 31, 2020 and December 31, 2019, were reserves of $0.3 million, related to environmental remediation at the Pearland, Texas facility previously used by the Company's discontinued Pauluhn business, and $0.8 million, related to estimated product liability obligations of the discontinued North American refuse truck body business.

Legal Proceedings

The Company is subject to various claims, including pending and possible legal actions for product liability and other damages, and other matters arising in the ordinary course of the Company's business. On a quarterly basis, the Company reviews uninsured material legal claims against the Company and accrues for the costs of such claims as appropriate in the exercise of management's best judgment and experience. However, due to a lack of factual information available to the Company about a claim, or the procedural stage of a claim, it may not be possible for the Company to reasonably assess either the probability of a favorable or unfavorable outcome of the claim or to reasonably estimate the amount of loss should there be an unfavorable outcome. Therefore, for many claims, the Company cannot reasonably estimate a range of loss.

The Company believes, based on current knowledge and after consultation with counsel, that the outcome of such claims and actions will not have a material adverse effect on the Company's results of operations or financial condition. However, in the event of unexpected future developments, it is possible that the ultimate resolution of such matters, if unfavorable, could have a material adverse effect on the Company's results of operations, financial condition or cash flow.

Hearing Loss Litigation

The Company has been sued for monetary damages by firefighters who claim that exposure to the Company's sirens has impaired their hearing and that the sirens are therefore defective. There were 33 cases filed during the period of 1999 through 2004, involving a total of 2,443 plaintiffs, in the Circuit Court of Cook County, Illinois. These cases involved more than 1,800 firefighter plaintiffs from locations outside of Chicago. In 2009, six additional cases were filed in Cook County, involving 299 Pennsylvania firefighter plaintiffs. During 2013, another case was filed in Cook County involving 74 Pennsylvania firefighter plaintiffs.

The trial of the first 27 of these plaintiffs' claims occurred in 2008, whereby a Cook County jury returned a unanimous verdict in favor of the Company.

An additional 40 Chicago firefighter plaintiffs were selected for trial in 2009. Plaintiffs' counsel later moved to reduce the number of plaintiffs from 40 to nine. The trial for these nine plaintiffs concluded with a verdict against the Company and for the plaintiffs in varying amounts totaling $0.4 million. The Company appealed this verdict. On September 13, 2012, the Illinois Appellate Court rejected this appeal. The Company thereafter filed a petition for rehearing with the Illinois Appellate Court, which was denied on February 7, 2013. The Company sought further review by filing a petition for leave to appeal with the Illinois Supreme Court on March 14, 2013. On May 29, 2013, the Illinois Supreme Court issued a summary order declining to accept review of this case. On July 1, 2013, the Company satisfied the judgments entered for these plaintiffs, which resulted in final dismissal of these cases.

A third consolidated trial involving eight Chicago firefighter plaintiffs occurred during November 2011. The jury returned a unanimous verdict in favor of the Company at the conclusion of this trial.

Following this trial, on March 12, 2012 the trial court entered an order certifying a class of the remaining Chicago Fire Department firefighter plaintiffs for trial on the sole issue of whether the Company's sirens were defective and unreasonably dangerous. The Company petitioned the Illinois Appellate Court for interlocutory appeal of this ruling. On May 17, 2012, the Illinois Appellate Court accepted the Company's petition. On June 8, 2012, plaintiffs moved to dismiss the appeal, agreeing with the Company that the trial court had erred in certifying a class action trial in this matter. Pursuant to plaintiffs' motion, the Illinois Appellate Court reversed the trial court's certification order.

Thereafter, the trial court scheduled a fourth consolidated trial involving three firefighter plaintiffs, which began in December 2012. Prior to the start of this trial, the claims of two of the three firefighter plaintiffs were dismissed. On December 17, 2012, the jury entered a complete defense verdict for the Company.

Following this defense verdict, plaintiffs again moved to certify a class of Chicago Fire Department plaintiffs for trial on the sole issue of whether the Company's sirens were defective and unreasonably dangerous. Over the Company's objection, the trial court granted plaintiffs' motion for class certification on March 11, 2013 and scheduled a class action trial to begin on June 10, 2013. The Company filed a petition for review with the Illinois Appellate Court on March 29, 2013 seeking reversal of the class certification order.

On June 25, 2014, a unanimous three-judge panel of the First District Illinois Appellate Court issued its opinion reversing the class certification order of the trial court. Specifically, the Appellate Court determined that the trial court's ruling failed to satisfy the class-action requirements that the common issues of the firefighters' claims predominate over the individual issues and that there is an adequate representative for the class. During a status hearing on October 8, 2014, plaintiffs represented to the Court that they would again seek to certify a class of firefighters on the issue of whether the Company's sirens were defective and unreasonably dangerous. On January 12, 2015, plaintiffs filed motions to amend their complaints to add class action allegations with respect to Chicago firefighter plaintiffs, as well as the approximately 1,800 firefighter plaintiffs from locations outside of Chicago. On March 11, 2015, the trial court granted plaintiffs' motions to amend their complaints. On April 24, 2015, the cases were transferred to Cook County chancery court, which will decide all class certification issues. On March 23, 2018, plaintiffs filed a motion to certify as a class all firefighters from the Chicago Fire Department who have filed lawsuits in this matter. The parties have requested discovery from each other related to this motion. The Company intends to continue its objections to any attempt at certification.

The Company has also filed motions to dismiss cases involving firefighters who worked for fire departments located outside of the State of Illinois based on improper venue. On February 24, 2017, the Circuit Court of Cook County entered orders dismissing the cases of 1,770 such firefighter plaintiffs from the jurisdiction of the State of Illinois. Pursuant to these orders, these plaintiffs had six months thereafter to refile their cases in jurisdictions where these firefighters are located. Prior to this six-month deadline, attorneys representing some of these plaintiffs contacted the Company regarding possible settlement of their cases. During the year ended December 31, 2017, the Company entered into a global settlement agreement with two attorneys who represented approximately 1,090 of these plaintiffs. Under the terms of the settlement agreement, the Company offered $700 per plaintiff to settle these cases and 717 plaintiffs accepted this offer as a final settlement. The attorneys representing these plaintiffs agreed to withdraw from representing plaintiffs who did not respond to the settlement offer. It is the Company's position that the non-settling plaintiffs who failed to timely refile their cases following the February 2017 dismissal by the Circuit Court of Cook County are now barred from doing so by the statute of limitations. The Company filed a venue motion seeking to transfer to DuPage County cases involving 10 plaintiffs who reside and work in Illinois but outside of Cook County. The Court granted this motion on June 28, 2017.

The Company has also been sued on this issue outside of the Cook County, Illinois venue. Between 2007 and 2009, a total of 71 lawsuits involving 71 plaintiffs were filed in the Court of Common Pleas, Philadelphia County, Pennsylvania. Three of these cases were dismissed pursuant to pretrial motions filed by the Company. Another case was voluntarily dismissed. Prior to trial in four cases, the Company paid nominal sums to obtain dismissals.

Three trials occurred in Philadelphia involving these cases filed in 2007 through 2009. The first trial involving one of these plaintiffs occurred in 2010, when the jury returned a verdict for the plaintiff. In particular, the jury found that the Company's siren was not defectively designed, but that the Company negligently constructed the siren. The jury awarded damages in the amount of $0.1 million, which was subsequently reduced to $0.08 million. The Company appealed this verdict. Another trial, involving nine Philadelphia firefighter plaintiffs, also occurred in 2010 when the jury returned a defense verdict for the Company as to all claims and all plaintiffs involved in that trial. The third trial, also involving nine Philadelphia firefighter plaintiffs, was completed during 2010 when the jury returned a defense verdict for the Company as to all claims and all plaintiffs involved in that trial.

Following defense verdicts in the last two Philadelphia trials, the Company negotiated settlements with respect to all remaining filed cases in Philadelphia at that time, as well as other firefighter claimants represented by the attorney who filed the Philadelphia cases. On January 4, 2011, the Company entered into a Global Settlement Agreement (the "Settlement Agreement") with the law firm of the attorney representing the Philadelphia claimants, on behalf of 1,125 claimants the firm represented (the "Claimants") and who had asserted product claims against the Company (the "Claims"). Three hundred eight of the Claimants had lawsuits pending against the Company in Cook County, Illinois.

The Settlement Agreement provided that the Company pay a total amount of $3.8 million (the "Settlement Payment") to settle the Claims (including the costs, fees and other expenses of the law firm in connection with its representation of the Claimants), subject to certain terms, conditions and procedures set forth in the Settlement Agreement. In order for the Company to be required to make the Settlement Payment: (i) each Claimant who agreed to settle his or her claims had to sign a release acceptable to the Company (a "Release"), (ii) each Claimant who agreed to the settlement and who was a plaintiff in a lawsuit, had to dismiss his or her lawsuit with prejudice, (iii) by April 29, 2011, at least 93% of the Claimants identified in the Settlement Agreement must have agreed to settle their claims and provide a signed Release to the Company and (iv) the law firm had to withdraw from representing any Claimants who did not agree to the settlement, including those who filed lawsuits. If the conditions to the settlement were met, but less than 100% of the Claimants agreed to settle their Claims and sign a Release, the Settlement Payment would be reduced by the percentage of Claimants who did not agree to the settlement.

On April 22, 2011, the Company confirmed that the terms and conditions of the Settlement Agreement had been met and made a payment of $3.6 million to conclude the settlement. The amount was based upon the Company's receipt of 1,069 signed releases provided by Claimants, which was 95% of all Claimants identified in the Settlement Agreement.

The Company generally denies the allegations made in the claims and lawsuits by the Claimants and denies that its products caused any injuries to the Claimants. Nonetheless, the Company entered into the Settlement Agreement for the purpose of minimizing its expenses, including legal fees, and avoiding the inconvenience, uncertainty and distraction of the claims and lawsuits.

During April through October 2012, 20 new cases were filed in the Court of Common Pleas, Philadelphia County, Pennsylvania. These cases were filed on behalf of 20 Philadelphia firefighters and involve various defendants in addition to the Company. Five of these cases were subsequently dismissed. The first trial involving these 2012 Philadelphia cases occurred during December 2014 and involved three firefighter plaintiffs. The jury returned a verdict in favor of the Company. Following this trial, all of the parties agreed to settle cases involving seven firefighter plaintiffs set for trial during January 2015 for nominal amounts per plaintiff.

In January 2015, plaintiffs' attorneys filed two new complaints in the Court of Common Pleas, Philadelphia, Pennsylvania on behalf of approximately 70 additional firefighter plaintiffs. The vast majority of the firefighters identified in these complaints are located outside of Pennsylvania. One of the complaints in these cases, which involves 11 firefighter plaintiffs from the District of Columbia, was removed to federal court in the Eastern District of Pennsylvania. Plaintiffs voluntarily dismissed all claims in this case on May 31, 2016. The Company thereafter moved to recover various fees and costs in this case, asserting that plaintiffs' counsel failed to properly investigate these claims prior to filing suit. The Court granted this motion on April 25, 2017, awarding $0.1 million to the Company. After plaintiffs appealed this Order, the United States Court of Appeals for the Third Circuit affirmed the lower court decision awarding fees and costs to the Company.

With respect to claims of other out-of-state firefighters involved in these two cases, the Company moved to dismiss these claims as improperly filed in Pennsylvania. The Court granted this motion and dismissed these claims on November 5, 2015. During August through December 2015, another nine new cases were filed in the Court of Common Pleas, Philadelphia County, Pennsylvania. These cases involve a total of 193 firefighters, most of whom are located outside of Pennsylvania. The Company again moved to dismiss all claims filed by out-of-state firefighters in these cases as improperly filed in Pennsylvania. On May 24, 2016, the Court granted this motion and dismissed these claims. Plaintiffs appealed this decision and, on September 25, 2018, the appellate court reversed this dismissal. The Company has filed a petition with the appellate court requesting that the court reconsider its ruling. On December 7, 2018, the appellate court granted the Company's petition and withdrew its prior decision. The Court has ordered that the parties file additional briefs and a new panel of appellate judges issue a decision. The parties have supplied briefs to the Court and the Court has heard oral argument on this case. The Company is awaiting a decision in this case.

On May 13, 2016, four new cases were filed in Philadelphia state court, involving a total of 55 Philadelphia firefighters who live in Pennsylvania. During August 2016, the Company settled a case involving four Philadelphia firefighters that had been set for trial in Philadelphia state court during September 2016. During 2017, plaintiffs filed additional cases in the Court of Common Pleas, Philadelphia County, involving over 100 Philadelphia firefighter plaintiffs. During January 2017, plaintiffs filed a motion to consolidate and bifurcate, similar to a motion filed in the Pittsburgh hearing loss cases, as described below. The Company has filed an opposition to this motion. These cases were then transferred to the mass tort program in Philadelphia for pretrial purposes. Plaintiffs' counsel thereafter dismissed several plaintiffs. During November 2017, a trial involving one Philadelphia firefighter occurred. The jury returned a verdict in favor of the Company in this trial. Prior to a dismissal of these cases pursuant to the Tolling Agreement, discussed below, there was a total of 75 firefighters involved in cases pending in the Philadelphia mass tort program.

During April through July 2013, additional cases were filed in Allegheny County, Pennsylvania on behalf of 247 plaintiff firefighters from Pittsburgh and against various defendants, including the Company. During May 2016, two additional cases were filed against the Company in Allegheny County involving 19 Pittsburgh firefighters. After the Company filed pretrial motions, the Court dismissed claims of 55 Pittsburgh firefighter plaintiffs. The Court scheduled trials for May, September and November 2016, for eight firefighters per trial. Prior to the first scheduled trial in Pittsburgh, the Court granted the Company's motion for summary judgment and dismissed all claims asserted by plaintiff firefighters involved in this trial. Following an appeal by the plaintiff firefighters, the appellate court affirmed this dismissal. The next trial for six Pittsburgh firefighters started on November 7, 2016. Shortly after this trial began, plaintiffs' counsel moved for a mistrial because a key witness suddenly became unavailable. The Court granted this motion and rescheduled this trial for March 6, 2017. During January 2017, plaintiffs also moved to consolidate and bifurcate trials involving Pittsburgh firefighters. In particular, plaintiffs sought one trial involving liability issues which will apply to all Pittsburgh firefighters who filed suit against the Company. The Company filed an opposition to this motion. On April 18, 2017, the trial court granted plaintiffs' motion to bifurcate the next Pittsburgh trial. Pursuant to a motion for clarification filed by the Company, the Court ruled that the bifurcation order would only apply to six plaintiffs who were part of the next trial group in Pittsburgh. The Company thereafter sought an interlocutory appeal of the Court's bifurcation order. The appellate court declined to accept the appeal at that time. A bifurcated trial began on September 27, 2017 in Allegheny County, Pennsylvania. Prior to and during trial, two plaintiffs were dismissed, resulting in four plaintiffs remaining for trial. After approximately two weeks of trial, the jury found that the Company's siren product was not defective or unreasonably dangerous and rendered a verdict in favor of the Company.

A second trial involving Pittsburgh firefighters began during January 2018. At the outset of this trial, plaintiffs' attorneys requested that the Company consider settlement of various cases. This trial was continued to allow the parties to further discuss possible settlement. During March 2018, the parties agreed in principle on a framework (the "Settlement Framework") to resolve hearing loss claims and cases in all jurisdictions involved in the hearing loss litigation except in Cook County and Lackawanna County, and excluding one case involving one firefighter in New York City. The firefighters excluded from the Settlement Framework are represented by different attorneys. The Company has agreed in principle to settle the cases in

Lackawanna County and the case involving one firefighter in New York City for nominal amounts. Pursuant to the Settlement Framework, the Company would pay $700 to each firefighter who has filed a lawsuit and is eligible to be part of the settlement. The Company would pay $300 to each firefighter who has not yet filed a case and is eligible to be part of the settlement. To be eligible for settlement, among other things, firefighters must provide proof that they have high frequency noise-induced hearing loss. There are approximately 3,700 firefighters whose claims may be considered as part of this settlement, including approximately 1,320 firefighters who have ongoing filed lawsuits. This Settlement Framework was finalized in a global settlement agreement executed on November 4, 2019 (the "Framework Agreement"). Pursuant to the Framework Agreement, the parties are now in the process of determining how many of the approximately 3,700 firefighters will be eligible to participate in the settlement. In order to minimize the parties' respective legal costs and expenses during this settlement process, on July 5, 2018, the parties entered into a tolling agreement (the "Tolling Agreement"). Pursuant to the Tolling Agreement, counsel for the settling firefighters agreed to dismiss the pending lawsuits in all jurisdictions except for the Allegheny County (Pittsburgh), Pennsylvania cases, and the Company agreed to a tolling of any statute of limitations applicable to the dismissed cases. The Tolling Agreement continued in place until the parties executed the Framework Agreement on November 4, 2019. After execution of the Framework Agreement, the Allegheny County (Pittsburgh) cases were dismissed. The Framework Agreement requires plaintiffs' attorneys to withdraw from representing firefighters who elect not to participate in this settlement.

As of March 31, 2020, the Company has recognized an estimated liability for the potential settlement amount. While it is reasonably possible that the ultimate resolution of this matter may result in a loss in excess of the amount accrued, the incremental loss is not expected to be material.

During March 2014, an action also was brought in the Court of Common Pleas of Erie County, Pennsylvania on behalf of 61 firefighters. This case likewise involves various defendants in addition to the Company. After the Company filed pretrial motions, 33 Erie County firefighter plaintiffs voluntarily dismissed their claims. During August 2017, five cases involving 70 firefighter plaintiffs were filed in Lackawanna County, Pennsylvania. These cases involve firefighter plaintiffs who originally filed in Cook County and were dismissed pursuant to the Company's forum nonconveniens motion. As of March 31, 2020, a total of 263 firefighters are involved in cases filed in Allegheny and Lackawanna counties in Pennsylvania.

On September 17, 2014, 20 lawsuits, involving a total of 193 Buffalo Fire Department firefighters, were filed in the Supreme Court of the State of New York, Erie County. All of the cases filed in Erie County, New York have been removed to federal court in the Western District of New York. Plaintiffs have filed a motion to consolidate and bifurcate these cases, similar to the motion filed in the Pittsburgh hearing loss cases, as described above. The Company has filed an opposition to the motion. During February 2015, a lawsuit involving one New York City firefighter plaintiff was filed in the Supreme Court of the State of New York, New York County. The plaintiff named the Company as well as several other parties as defendants. That case subsequently was transferred to federal court in the Northern District of New York and thereafter dismissed. During April 2015 through January 2016, 29 new cases involving a total of 235 firefighters were filed in various counties in the New York City area. During December 2016 through October 2017, additional cases were filed in these jurisdictions. On February 5, 2018, the Company was served with a complaint in an additional case filed in Kings County, New York. This case involves one plaintiff. Prior to a dismissal of these cases pursuant to the Tolling Agreement, there was a total of 536 firefighters involved in cases filed in the State of New York.

During November 2015, the Company was served with a complaint filed in Union County, New Jersey state court, involving 34 New Jersey firefighters. This case has been transferred to federal court in the District of New Jersey. During the period from January through May 2016, eight additional cases were filed in various New Jersey state courts. Most of the firefighters in these cases reside in New Jersey and work or worked at New Jersey fire departments. During December 2016, a case involving one New Jersey firefighter was filed in the United States District Court of New Jersey. On May 2, 2017, plaintiffs filed a motion to consolidate and bifurcate in the pending federal court case in New Jersey. This motion was similar to bifurcation motions filed by plaintiffs in Pittsburgh, Buffalo and Philadelphia. The Court has denied this motion as premature. Pursuant to a petition filed by both parties, all New Jersey state court cases were consolidated for pretrial purposes. Prior to a dismissal of these cases pursuant to the Tolling Agreement, there was a total of 61 firefighters involved in cases filed in New Jersey.

During May through October 2016, nine cases were filed in Suffolk County, Massachusetts state court, naming the Company as a defendant. These cases involve 194 firefighters who lived and worked in the Boston area. During August 2017, plaintiffs filed additional cases in Suffolk County court. The Company moved to transfer various cases filed in Suffolk County to other counties in Massachusetts where plaintiffs reside and work. Prior to a dismissal of these cases pursuant to the Tolling Agreement, there was a total of 218 firefighters involved in cases filed in Massachusetts.

During August and September 2017, plaintiffs' attorneys filed additional hearing loss cases in Florida. The Company is the only named defendant. These cases were filed in several different counties in Florida, including Tampa, Miami and Orlando municipalities. Plaintiffs have agreed to stipulate that they will not seek more than $75,000 in damages in any individual plaintiff case. Prior to a dismissal of these cases pursuant to the Tolling Agreement, there was a total of 166 firefighters involved in cases filed in Florida.

From 2007 through 2009, firefighters also brought hearing loss claims against the Company in New Jersey, Missouri, Maryland and Kings County, New York. All of those cases, however, were dismissed prior to trial, including four cases in the Supreme Court of Kings County, New York that were dismissed upon the Company's motion in 2008. On appeal, the New York appellate court affirmed the trial court's dismissal of these cases. Plaintiffs' attorneys have threatened to file additional lawsuits. The Company intends to vigorously defend all of these lawsuits, if filed.

NOTE 8 – EARNINGS PER SHARE

The Company computes earnings per share ("EPS") in accordance with Accounting Standards Codification ("ASC") 260, *Earnings per Share*, which requires that non-vested restricted stock containing non-forfeitable dividend rights should be treated as participating securities pursuant to the two-class method. Under the two-class method, net income is reduced by the amount of dividends declared in the period for common stock and participating securities. The remaining undistributed earnings are then allocated to common stock and participating securities as if all of the net income for the period had been distributed. The amounts of distributed and undistributed earnings allocated to participating securities for the three months ended March 31, 2020 and 2019 were insignificant and did not materially impact the calculation of basic or diluted EPS.

Basic EPS is computed by dividing income available to common stockholders by the weighted average number of shares of common stock and non-vested restricted stock awards outstanding for the period.

Diluted EPS is computed using the weighted average number of shares of common stock and non-vested restricted stock awards outstanding for the year, plus the effect of dilutive potential common shares outstanding during the period. The dilutive effect of common stock equivalents is determined using the more dilutive of the two-class method or alternative methods. The Company uses the treasury stock method to determine the potentially dilutive impact of our employee stock options and restricted stock units, and the contingently issuable method for our performance-based restricted stock unit awards.

For the three months ended March 31, 2020 and 2019, options to purchase 0.2 million and 0.3 million shares of the Company's common stock, respectively, had an anti-dilutive effect on EPS, and accordingly, are excluded from the calculation of diluted EPS.

The following table reconciles Net income to basic and diluted EPS:

	Three Months Ended March 31,	
(in millions, except per share data)	**2020**	**2019**
Net income	$ 23.4	$ 17.5
Weighted average shares outstanding – Basic	60.5	60.1
Dilutive effect of common stock equivalents	1.2	1.1
Weighted average shares outstanding – Diluted	61.7	61.2
Earnings per share:		
Basic	$ 0.39	$ 0.29
Diluted	0.38	0.29

NOTE 9 – STOCKHOLDERS' EQUITY

Dividends

On February 19, 2020, the Company's Board of Directors (the "Board") declared a quarterly cash dividend of $0.08 per common share. The dividend totaled $4.8 million and was distributed on March 31, 2020 to holders of record at the close of business on March 18, 2020. During the three months ended March 31, 2019, dividends of $4.8 million were paid to stockholders.

On April 21, 2020, the Board declared a quarterly cash dividend of $0.08 per common share payable on June 2, 2020 to holders of record at the close of business on May 15, 2020.

Stock Repurchase Program

In November 2014, the Board authorized a stock repurchase program (the "November 2014 program") of up to $75.0 million of the Company's common stock.

On March 13, 2020, the Board authorized an additional stock repurchase program (the "March 2020 program") of up to $75.0 million of the Company's common stock. The March 2020 program supplements the Board's prior authorization under the November 2014 program, which remains in effect.

The stock repurchase programs are intended primarily to facilitate purchases of Company stock as a means to provide cash returns to stockholders, enhance stockholder returns and manage the Company's capital structure. Under its stock repurchase programs, the Company is authorized to repurchase, from time to time, shares of its outstanding common stock. Stock repurchases by the Company are subject to market conditions and other factors and may be commenced, suspended or discontinued at any time.

During the three months ended March 31, 2020, the Company repurchased 490,990 shares for a total of $13.5 million under the stock repurchase program. During the three months ended March 31, 2019, the Company repurchased 48,409 shares for a total of $1.0 million under the stock repurchase program. In light of the current uncertainty and volatility resulting from the COVID-19 pandemic, the Company has elected to suspend stock repurchases but may resume such repurchases in the future.

Accumulated Other Comprehensive Loss

The following tables summarize the changes in each component of Accumulated other comprehensive loss, net of tax in the three months ended March 31, 2020 and 2019:

(in millions) [a]	Actuarial Losses	Prior Service Costs	Foreign Currency Translation	Unrealized Gain (Loss) on Interest Rate Swaps	Total
Balance at January 1, 2020	$ (80.4)	$ (2.4)	$ (7.1)	$ 0.8	$ (89.1)
Other comprehensive income (loss) before reclassifications	1.1	—	(6.1)	(3.0)	(8.0)
Amounts reclassified from accumulated other comprehensive loss	0.7	—	—	(0.1)	0.6
Net current-period other comprehensive income (loss)	1.8	—	(6.1)	(3.1)	(7.4)
Balance at March 31, 2020	$ (78.6)	$ (2.4)	$ (13.2)	$ (2.3)	$ (96.5)

(in millions) [a]	Actuarial Losses	Prior Service Costs	Foreign Currency Translation	Unrealized Gain (Loss) on Interest Rate Swaps	Total
Balance at January 1, 2019	$ (87.4)	$ (2.5)	$ (8.9)	$ 1.5	$ (97.3)
Other comprehensive loss before reclassifications	(0.4)	—	—	(0.2)	(0.6)
Amounts reclassified from accumulated other comprehensive loss	0.6	—	—	(0.3)	0.3
Net current-period other comprehensive income (loss)	0.2	—	—	(0.5)	(0.3)
Balance at March 31, 2019	$ (87.2)	$ (2.5)	$ (8.9)	$ 1.0	$ (97.6)

(a) Amounts in parentheses indicate losses.

The following table summarizes the amounts reclassified from Accumulated other comprehensive loss, net of tax, in the three months ended March 31, 2020 and 2019 and the affected line item in the Condensed Consolidated Statements of Operations:

Details about Accumulated Other Comprehensive Loss Components	Amount Reclassified from Accumulated Other Comprehensive Loss 2020	2019	Affected Line Item in Condensed Consolidated Statements of Operations
(in millions) [a]			
Amortization of actuarial losses of defined benefit pension plans	$ (0.9)	$ (0.8)	Other expense, net
Interest income on interest rate swaps	0.1	0.4	Interest expense
Total before tax	(0.8)	(0.4)	
Income tax benefit	0.2	0.1	Income tax expense
Total reclassifications for the period, net of tax	$ (0.6)	$ (0.3)	

(a) Amounts in parentheses indicate losses.

NOTE 10 – SEGMENT INFORMATION

The Company has two reportable segments: the Environmental Solutions Group and the Safety and Security Systems Group. Business units are organized under each reportable segment because they share certain characteristics, such as technology, marketing, distribution and product application, which create long-term synergies.

The following tables summarize the Company’s operations by segment, including Net sales, Operating income (loss), and Total assets:

(in millions)	Three Months Ended March 31, 2020	2019
Net sales:		
Environmental Solutions	$ 233.0	$ 219.5
Safety and Security Systems	53.1	54.3
Total net sales	$ 286.1	$ 273.8
Operating income (loss):		
Environmental Solutions	$ 29.4	$ 25.7
Safety and Security Systems	7.4	8.7
Corporate and eliminations	(4.5)	(8.6)
Total operating income	32.3	25.8
Interest expense	1.5	2.0
Other expense, net	0.2	0.4
Income before income taxes	$ 30.6	$ 23.4

(in millions)	As of March 31, 2020	As of December 31, 2019
Total assets:		
Environmental Solutions	$ 939.0	$ 908.1
Safety and Security Systems	223.4	222.6
Corporate and eliminations	64.4	34.5
Total assets of continuing operations	1,226.8	1,165.2
Total assets of discontinued operations	0.3	0.3
Total assets	$ 1,227.1	$ 1,165.5

NOTE 11 – FAIR VALUE MEASUREMENTS

The Company uses a three-level fair value hierarchy that prioritizes the inputs used to measure fair value. This hierarchy maximizes the use of observable inputs and minimizes the use of unobservable inputs. Observable inputs are developed based on market data obtained from independent sources, while unobservable inputs reflect the Company's assumptions about valuation based on the best information available in the circumstances. The three levels of inputs are classified as follows:

- Level 1 — quoted prices in active markets for identical assets or liabilities;
- Level 2 — observable inputs, other than quoted prices included in Level 1, such as quoted prices for markets that are not active, or other inputs that are observable or can be corroborated by observable market data; and
- Level 3 — unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities, including certain pricing models, discounted cash flow methodologies and similar techniques that use significant unobservable inputs.

In determining fair value, the Company uses various valuation approaches within the fair value measurement framework. The valuation methodologies used for the Company's assets and liabilities measured at fair value and their classification in the valuation hierarchy are summarized below:

Cash Equivalents

Cash equivalents primarily consist of time-based deposits and interest-bearing instruments with maturities of three months or less. The Company classified cash equivalents as Level 1 due to the short-term nature of these instruments and measured the fair value based on quoted prices in active markets for identical assets.

Interest Rate Swaps

As described in Note 4 – Debt, the Company may, from time to time, execute interest rate swaps as a means of fixing the floating interest rate component on a portion of its floating-rate debt. The Company classifies its interest rate swaps as Level 2 due to the use of a discounted cash flow model based on the terms of the contract and the interest rate curve (Level 2 inputs) to calculate the fair value of the swaps.

Contingent Consideration

The Company has a contingent obligation to transfer up to $15.5 million to the former owners of Mark Rite Lines Equipment Company, Inc. ("MRL"), a U.S. manufacturer of truck-mounted and ride-on road-marking and line-removal equipment acquired by the Company on July 1, 2019, if specified financial results are met over future reporting periods (i.e., an earn-out). Liabilities for contingent consideration are measured at fair value each reporting period, with the acquisition-date fair value included as part of the consideration transferred. Subsequent changes in fair value are included as a component of Acquisition and integration-related expenses on the Condensed Consolidated Statements of Operations.

The Company uses an income approach to value the contingent consideration obligation based on the present value of risk-adjusted future cash flows under either a scenario-based or option-pricing method, as appropriate. Due to the lack of relevant observable market data over fair value inputs, such as prospective financial information or probabilities of future events as of March 31, 2020, the Company has classified the contingent consideration liability within Level 3 of the fair value hierarchy outlined in ASC 820, *Fair Value Measurements*.

The following table summarizes the Company's assets and liabilities that are measured at fair value on a recurring basis as of March 31, 2020:

	Fair Value Measurement at Reporting Date Using			
(in millions)	**Level 1**	**Level 2**	**Level 3**	**Total**
Assets:				
Cash equivalents	$ 3.2	$ —	$ —	$ 3.2
Liabilities:				
Contingent consideration	—	—	4.3	4.3
Interest rate swap	—	3.1	—	3.1

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS — (CONTINUED)
(Unaudited)

The following table provides a roll-forward of the fair value of recurring Level 3 fair value measurements in the three months ended March 31, 2020 and 2019:

(in millions)	2020	2019 [(a)]
Contingent consideration liability, at January 1	$ 4.3	$ 6.7
Foreign currency translation	—	0.2
Total losses included in earnings	0.0	0.2
Contingent consideration liability, at March 31	$ 4.3	$ 7.1

(a) Activity in three months ended March 31, 2019 relates to a contingent obligation to provide additional consideration to the former owners of Joe Johnson Equipment, Inc. and Joe Johnson Equipment (USA), Inc. based on the achievement of specified financial results over the three-year period following the closing of the acquisition. During the third quarter of 2019, the Company paid $7.6 million to settle this contingent consideration liability.

Item 2. ***Management's Discussion and Analysis of Financial Condition and Results of Operations.***

Management's Discussion and Analysis of Financial Condition and Results of Operations ("MD&A") is designed to provide information that is supplemental to, and should be read together with, the condensed consolidated financial statements and the accompanying notes contained in this Form 10-Q, as well as the Company's Annual Report on Form 10-K for the year ended December 31, 2019. Information in MD&A is intended to assist the reader in obtaining an understanding of (i) the condensed consolidated financial statements, (ii) the Company's business segments and how the results of those segments impact the Company's results of operations and financial condition as a whole and (iii) how certain accounting principles affect the Company's condensed consolidated financial statements. The Company's results for interim periods should not be regarded as necessarily indicative of results that may be expected for the entire year, which may differ materially due to, among other things, the risk factors described under Part I, Item 1A, *Risk Factors*, of the Company's Annual Report on Form 10-K for the year ended December 31, 2019, which was filed with the SEC on February 29, 2020, and as updated in Part II, Item 1A, *Risk Factors*, in this Form 10-Q.

Executive Summary

The Company is a leading global manufacturer and supplier of (i) vehicles and equipment for maintenance and infrastructure end-markets, including sewer cleaners, industrial vacuum loaders, vacuum- and hydro-excavation trucks (collectively, "safe-digging trucks"), street sweepers, road-marking and line-removal equipment, waterblasting equipment, dump truck bodies and trailers, and (ii) safety, security and communication equipment, such as lights, sirens and warning systems. In addition, we sell parts and provide service, repair, equipment rentals and training as part of a comprehensive aftermarket offering to our customer base. We operate 15 principal manufacturing facilities in five countries and provide products and integrated solutions to municipal, governmental, industrial and commercial customers in all regions of the world.

As described in Note 10 – Segment Information to the accompanying condensed consolidated financial statements, the Company's business units are organized in two reportable segments: the Environmental Solutions Group and the Safety and Security Systems Group.

Results for the three months ended March 31, 2020 vs. the three months ended March 31, 2019

Net sales increased by $12.3 million, or 4%, in the three months ended March 31, 2020 as compared to the prior-year quarter. Our Environmental Solutions Group reported a net sales increase of $13.5 million, or 6%, primarily due to increases in shipments of road-marking and line-removal equipment, dump truck bodies, safe-digging trucks and street sweepers of $8.0 million, $3.6 million, $2.9 million and $1.3 million, respectively. In addition, aftermarket revenues increased by $4.0 million. Partially offsetting these improvements were reductions in shipments of waterblasting equipment, trailers, and snow removal trucks of $2.9 million, $2.3 million, and $1.6 million, respectively. Within our Safety and Security Systems Group, net sales decreased by $1.2 million, or 2%, primarily due to lower sales of warning systems and public safety equipment, partially offset by higher sales of industrial signaling equipment.

Operating income increased by $6.5 million, or 25%, to $32.3 million in the three months ended March 31, 2020 as compared to the prior-year quarter, primarily driven by a $3.7 million increase within our Environmental Solutions Group and a $4.1 million reduction in Corporate expenses, partially offset by a $1.3 million decrease in operating income within our Safety and Security Systems Group. Consolidated operating margin for the three months ended March 31, 2020 was 11.3%, up from 9.4% in the prior-year quarter.

Income before income taxes increased by $7.2 million, or 31%, to $30.6 million for the three months ended March 31, 2020 as compared to the prior-year quarter. The increase resulted from the higher operating income and reductions in interest expense and other expense of $0.5 million and $0.2 million, respectively.

Net income for the three months ended March 31, 2020 increased by $5.9 million compared to the prior-year period, largely due to the aforementioned increase in income before income taxes, partially offset by a $1.3 million increase in income tax expense. The increase in income tax expense was primarily due to higher income tax levels, partially offset by the recognition of a $0.7 million excess tax benefit from stock compensation activity, which lowered the effective tax rate for the three months ended March 31, 2020 to 23.5%. We currently expect our full-year effective tax rate to be within the range of 25% to 26%.

Total orders for the three months ended March 31, 2020 were $303.9 million, an increase of $4.9 million, or 2%, as compared to the prior-year quarter. Our Environmental Solutions Group reported total orders of $237.5 million in the first quarter of 2020, down $6.2 million, or 3% in comparison to the prior-year quarter. Orders in the three months ended March 31, 2020 within our Safety and Security Systems Group were $66.4 million, up $11.1 million, or 20%, compared to the prior-year quarter.

Our consolidated backlog at March 31, 2020 was $400.8 million, up $37.3 million, or 10%, compared to the end of the prior-year quarter. The increase was primarily due to a $23.0 million increase in backlog within the Environmental Solutions Group, largely due to increased demand for sewer cleaners, as well as higher orders for road-marking and line-removal equipment and refuse trucks. In addition, backlog within the Safety and Security Systems Group improved by $14.3 million, with the improvement largely due to higher global demand for public safety equipment.

COVID-19 Update

We are closely monitoring the potential impact of the COVID-19 pandemic on all aspects of our business, including how it is affecting our employees, customers, supply chain and distribution network. In February 2020, we established a cross-functional task force to monitor ongoing developments, implement mitigation plans and centrally coordinate our response to the pandemic.

Our businesses are considered to be essential in supporting critical infrastructure needs and public safety. While certain of our operations have been affected by temporary facility closures, either due to government-issued mandates or other concerns related to COVID-19, our facilities have so far remained substantially operational during the pandemic. Given that, our primary focus has been on the safety and wellbeing of our employees. We were proactive in implementing enhanced health and safety measures across the organization, establishing remote working arrangements, where possible, and increasing the frequency of communications to reinforce health and safety guidelines. We also modified our employee attendance policies and provided employees with additional paid time off in order to encourage those who were sick, had health concerns, or were otherwise adversely impacted by the pandemic, to remain at home.

As a result of the combination of these factors and the enactment of the CARES Act, in recent weeks we have experienced a decrease in labor availability at several of our facilities. This has resulted in a variety of challenges in running our operations efficiently, which has adversely affected productivity levels. We are also seeing similar issues within our supply chain, with certain suppliers temporarily shut down. In addition, certain customers are unable to take delivery of equipment given the limited personnel that they currently have available. Although these factors had a limited impact on our first-quarter results, we are expecting a more significant impact in the second quarter as we adjust our production schedules accordingly.

Our backlog as of March 31, 2020 was at a record level. However, the timing of production and realization of our backlog may be delayed or otherwise negatively impacted by our ability to continue to run our operations as an essential business during the COVID-19 pandemic and/or to maintain our normal production capacity, faced with the potential for adverse impacts associated with decreased labor availability, the temporary suspension of production activity mandated or otherwise made necessary by governmental authorities, weakened demand, supply chain disruptions, or other production delays. Such factors may adversely affect the comparability of our operating and financial results in subsequent quarters. We are responding accordingly, taking additional steps to manage through these times, including implementing measures to reduce costs and manage our capital prudently. At the same time, we are maintaining our focus on our eighty-twenty improvement initiatives.

We are approaching the uncertainty and challenges with resolve and from a position of strength given our current financial position. As of March 31, 2020, we had $69.4 million of cash and cash equivalents and $210.6 million of availability for borrowings under our five-year revolving credit facility, which we executed in July 2019.

However, the overall magnitude of the impact of the pandemic on our operating and financial results remains uncertain and will largely depend on the duration of the pandemic and the measures implemented in response, as well as the effect on our customers. Given these factors, we are unable to reliably forecast the effect that the pandemic will have on our financial condition, results of operations or cash flows, which could be material.

Results of Operations

The following table summarizes our Condensed Consolidated Statements of Operations and illustrates the key financial indicators used to assess our consolidated financial results:

	Three Months Ended March 31,		
($ in millions, except per share data)	2020	2019	Change
Net sales	$ 286.1	$ 273.8	$ 12.3
Cost of sales	211.3	203.5	7.8
Gross profit	74.8	70.3	4.5
Selling, engineering, general and administrative expenses	42.2	43.9	(1.7)
Acquisition and integration-related expenses	0.3	0.6	(0.3)
Operating income	32.3	25.8	6.5
Interest expense	1.5	2.0	(0.5)
Other expense, net	0.2	0.4	(0.2)
Income before income taxes	30.6	23.4	7.2
Income tax expense	7.2	5.9	1.3
Net income	$ 23.4	$ 17.5	$ 5.9
Operating data:			
Operating margin	11.3%	9.4%	1.9%
Diluted earnings per share	$ 0.38	$ 0.29	$ 0.09
Total orders	303.9	299.0	4.9
Backlog	400.8	363.5	37.3
Depreciation and amortization	10.8	9.5	1.3

Net sales

Net sales increased by $12.3 million, or 4%, in the three months ended March 31, 2020 as compared to the prior-year quarter. The Environmental Solutions Group reported a net sales increase of $13.5 million, or 6%, primarily due to increases in shipments of road-marking and line-removal equipment, dump truck bodies, safe-digging trucks and street sweepers of $8.0 million, $3.6 million, $2.9 million and $1.3 million, respectively. In addition, aftermarket revenues increased by $4.0 million. Partially offsetting these improvements were reductions in shipments of waterblasting equipment, trailers, and snow removal trucks of $2.9 million, $2.3 million, and $1.6 million, respectively. Within the Safety and Security Systems Group, net sales decreased by $1.2 million, or 2%, primarily due to lower sales of warning systems and public safety equipment, partially offset by higher sales of industrial signaling equipment.

Cost of sales

Cost of sales increased by $7.8 million, or 4%, for the three months ended March 31, 2020 compared to the prior-year quarter, largely due to an increase of $7.8 million, or 5%, within the Environmental Solutions Group, primarily attributable to increased sales volumes, additional cost of sales from the MRL acquisition, and a $1.0 million increase in depreciation expense.

Gross profit

Gross profit increased by $4.5 million, or 6%, for the three months ended March 31, 2020, compared to the prior-year quarter, primarily due to a $5.7 million improvement within the Environmental Solutions Group, partially offset by a $1.2 million reduction within the Safety and Security Systems Group. Gross margin for the three months ended March 31, 2020 improved to 26.1%, from 25.7% in the prior-year quarter, primarily driven by a 110-basis point improvement within the Environmental Solutions Group, primarily attributable to improved operating leverage, benefits from pricing actions and favorable sales mix.

Selling, engineering, general and administrative expenses

Selling, engineering, general and administrative (“SEG&A”) expenses for the three months ended March 31, 2020 decreased by $1.7 million, or 4%, primarily due to a $4.1 million reduction in Corporate SEG&A expenses, partially offset by a $2.3 million increase within the Environmental Solutions Group. As a percentage of net sales, SEG&A expenses decreased from 16.0% in the prior-year quarter, to 14.8% in the current-year quarter.

Operating income

Operating income increased by $6.5 million, or 25%, to $32.3 million in the three months ended March 31, 2020 as compared to the prior-year quarter, primarily driven by a $3.7 million increase within the Environmental Solutions Group and a $4.1 million reduction in Corporate expenses, partially offset by a $1.3 million decrease in operating income within the Safety and Security Systems Group. Consolidated operating margin for the three months ended March 31, 2020 was 11.3%, up from 9.4% in the prior-year quarter.

Interest expense

Interest expense for the three months ended March 31, 2020 decreased by $0.5 million, or 25%, largely due to lower average debt levels and interest rates when compared to the same period of the prior year.

Other expense, net

For the three months ended March 31, 2020, other expense totaled $0.2 million, while in the prior-year quarter, other expense was $0.4 million. The decrease in expense was primarily due to lower pension expense in comparison to the prior-year quarter.

Income tax expense

The Company recognized income tax expense of $7.2 million and $5.9 million for the three months ended March 31, 2020 and 2019, respectively. The increase in tax expense in the current-year quarter was largely due to higher pre-tax income levels, partially offset by the recognition of a $0.7 million excess tax benefit from stock compensation activity. The Company's effective tax rate for the three months ended March 31, 2020 was 23.5%, compared to 25.2% in the prior-year quarter.

Net income

Net income for the three months ended March 31, 2020 increased by $5.9 million compared to the prior-year period, largely due to the aforementioned increase in operating income, the $0.5 million reduction in interest expense and the $0.2 million decrease in other expense, partially offset by the $1.3 million increase in income tax expense.

Environmental Solutions

The following table summarizes the Environmental Solutions Group's operating results as of and for the three months ended March 31, 2020 and 2019:

	Three Months Ended March 31,		
($ in millions)	**2020**	**2019**	**Change**
Net sales	$ 233.0	$ 219.5	$ 13.5
Operating income	29.4	25.7	3.7
Operating data:			
Operating margin	12.6%	11.7%	0.9%
Total orders	$ 237.5	$ 243.7	$ (6.2)
Backlog	358.4	335.4	23.0
Depreciation and amortization	10.0	8.6	1.4

Total orders decreased by $6.2 million, or 3%, for the three months ended March 31, 2020. U.S. orders increased by $3.7 million, or 2%, primarily due to improvements in orders for road-marking and line-removal equipment, dump truck bodies, trailers, and street sweepers of $11.0 million, $7.8 million, $5.1 million, and $2.6 million, respectively. Additionally, aftermarket demand increased by $5.2 million. Partially offsetting these improvements were reductions in orders for safe-digging trucks, industrial vacuum loaders, sewer cleaners, and waterblasting equipment of $14.3 million, $9.1 million, $3.3 million, and $2.4 million, respectively. Non-U.S. orders decreased by $9.9 million, or 19%, primarily due to decreases in orders for safe-digging trucks, snow removal trucks, and sewer cleaners of $4.4 million, $2.2 million, and $1.6 million, respectively. In addition, aftermarket demand decreased by $2.5 million. Partially offsetting these reductions was a $3.0 million increase in orders for refuse trucks.

Net sales increased by $13.5 million, or 6%, for the three months ended March 31, 2020. U.S. sales increased by $21.5 million, or 12%, largely due to increases in shipments of road-marking and line-removal equipment, safe-digging trucks, sewer cleaners, dump truck bodies, and industrial vacuum loaders of $7.9 million, $6.1 million, $4.4 million, $3.3 million, and $1.1 million, respectively. In addition, aftermarket revenues increased by $4.3 million. Partially offsetting these improvements were reductions in shipments of waterblasting equipment, trailers, and street sweepers of $2.4 million, $2.3 million, and $1.4 million, respectively. Non-U.S. sales decreased by $8.0 million, or 17%, primarily due to decreases in sales of sewer cleaners, safe-digging trucks, snow removal trucks, and refuse trucks of $4.1 million, $3.2 million, $1.3 million, and $1.2 million, respectively, which were partially offset by a $2.7 million increase in shipments of street sweepers.

Cost of sales increased by $7.8 million, or 5%, for the three months ended March 31, 2020, primarily attributable to increased sales volumes, additional cost of sales from the MRL acquisition, and a $1.0 million increase in depreciation expense. Gross margin improved to 23.5% from 22.4% in the prior-year quarter, primarily due to improved operating leverage, benefits from pricing actions, and favorable sales mix.

SEG&A expenses increased by $2.3 million for the three months ended March 31, 2020, primarily due to the addition of expenses of businesses acquired in the prior year and a $0.4 million increase in amortization expense. As a percentage of net sales, SEG&A expenses were 10.9% in the current-year quarter, compared to 10.5% in the prior-year quarter.

Operating income for the three months ended March 31, 2020 increased by $3.7 million, largely due to a $5.7 million increase in gross profit and a $0.3 million decrease in acquisition-related expenses, partially offset by the $2.3 million increase in SEG&A expenses.

Backlog was $358.4 million at March 31, 2020, up $23.0 million, or 7% compared to $335.4 million at March 31, 2019. The increase was largely due to increased demand for sewer cleaners, as well as higher orders for road-marking and line-removal equipment and refuse trucks.

Safety and Security Systems

The following table summarizes the Safety and Security Systems Group's operating results as of and for the three months ended March 31, 2020 and 2019:

	Three Months Ended March 31,		
($ in millions)	**2020**	**2019**	**Change**
Net sales	$ 53.1	$ 54.3	$ (1.2)
Operating income	7.4	8.7	(1.3)
Operating data:			
Operating margin	13.9%	16.0%	(2.1)%
Total orders	$ 66.4	$ 55.3	$ 11.1
Backlog	42.4	28.1	14.3
Depreciation and amortization	0.8	0.9	(0.1)

Total orders for the three months ended March 31, 2020 increased by $11.1 million, or 20%, compared with the prior-year quarter. U.S. orders increased by $1.7 million, primarily driven by improvements in orders for warning systems and public safety equipment of $1.7 million and $1.3 million, respectively, partially offset by a $1.3 million reduction in orders for industrial signaling equipment. Non-U.S. orders increased by $9.4 million, largely due to improvements in orders for public safety equipment and warning systems of $9.3 million and $0.7 million, respectively, partially offset by an unfavorable foreign currency translation impact of $0.7 million.

Net sales decreased by $1.2 million, or 2%, for the three months ended March 31, 2020. U.S. sales decreased by $1.5 million, primarily driven by reductions in sales of public safety equipment, industrial signaling equipment, and warning systems of $0.9 million, $0.4 million, and $0.2 million, respectively. Non-U.S. sales increased by $0.3 million, largely due to increase in sales of industrial signaling equipment and public safety equipment of $1.1 million and $0.5 million, respectively, partially offset by a $0.9 million reduction in sales of warning systems and an unfavorable foreign currency translation impact of $0.4 million.

Cost of sales for the three months ended March 31, 2020 were unchanged from the prior-year quarter, with the effects of lower sales volumes and a $0.3 million favorable foreign currency translation impact being partially offset by unfavorable sales mix in comparison to the prior-year quarter. Gross margin for the three months ended March 31, 2020 was 37.7%, compared to 39.0% in the prior-year quarter.

SEG&A expenses for the three months ended March 31, 2020 increased by $0.1 million, or 1%, in comparison to the prior-year quarter. As a percentage of net sales, SEG&A expenses increased from 23.0% in the prior-year quarter, to 23.7% in the current-year quarter.

Operating income decreased by $1.3 million, or 15%, for the three months ended March 31, 2020. The decrease was primarily attributable to the $1.2 million reduction in gross profit and the $0.1 million increase in SEG&A expenses.

Backlog was $42.4 million at March 31, 2020, compared to $28.1 million at March 31, 2019, with the improvement largely due to higher global demand for public safety equipment.

Corporate Expenses

Corporate operating expenses for the three months ended March 31, 2020 were $4.5 million, down from $8.6 million in the prior-year quarter. The $4.1 million decrease was primarily due to reductions in post-employment expenses, stock-based compensation expense costs and incentive-based compensation costs.

Seasonality of Company’s Business

Certain of the Company’s businesses are susceptible to the influences of seasonal factors, including buying patterns, delivery patterns and productivity influences from holiday periods and weather. In general, the Company tends to have lower equipment sales in the first calendar quarter of each year compared to other quarters as a result of these factors. In addition, rental income and parts sales are generally higher in the second and third quarters of the year, because many of the Company’s products are used for maintenance activities in North America, where usage is typically lower during periods of harsher weather conditions. Due to the potential for adverse impacts associated with the current COVID-19 pandemic, the Company’s results in 2020 may not reflect the same seasonal trends as in prior years.

Financial Condition, Liquidity and Capital Resources

The Company uses its cash flow from operations to fund growth and to make capital investments that sustain its operations, reduce costs, or both. Beyond these uses, remaining cash is used to pay down debt, repurchase shares, fund dividend payments and make pension contributions. The Company may also choose to invest in the acquisition of businesses. In the absence of significant unanticipated cash demands, we believe that the Company’s existing cash balances, cash flow from operations and borrowings available under the 2019 Credit Agreement will provide funds sufficient for these purposes. As of March 31, 2020, there was $278.2 million of cash drawn and $11.2 million of undrawn letters of credit under the 2019 Credit Agreement, with $210.6 million of availability for borrowings. However, as described in Part II, Item 1A, *Risk Factors*, the current COVID-19 pandemic may materially adversely affect the Company’s business, financial condition and operating results, including its cash flows. The net cash flows associated with the Company’s rental equipment transactions are included in cash flow from operating activities.

The Company’s cash and cash equivalents totaled $69.4 million and $31.6 million as of March 31, 2020 and December 31, 2019, respectively. As of March 31, 2020, $18.2 million of cash and cash equivalents was held by foreign subsidiaries. Cash and cash equivalents held by subsidiaries outside the U.S. typically are held in the currency of the country in which it is located. The Company uses this cash to fund the operating activities of its foreign subsidiaries and for further investment in foreign operations. Generally, the Company has considered such cash to be permanently reinvested in its foreign operations and the Company’s current plans do not demonstrate a need to repatriate such cash to fund U.S. operations. However, in the event that these funds are needed to fund U.S. operations or to satisfy U.S. obligations, they generally could be repatriated. The repatriation of these funds may cause the Company to incur additional U.S. income tax expense, dependent on income tax laws and other circumstances at the time any such amounts are repatriated.

Net cash of $5.2 million was provided by operating activities in the three months ended March 31, 2020, whereas in the three months ended March 31, 2019, net cash of $8.8 million was used for operating activities. The first quarter is typically a period in which our businesses fund seasonal increases in working capital requirements. The year-over-year improvement in operating cash flow was primarily due to higher earnings and lower rental fleet and working capital investments in comparison to the prior year, partially offset by higher tax payments.

Net cash of $8.4 million was used for investing activities in the three months ended March 31, 2020, compared to $4.5 million in the prior-year period. Capital expenditures in the three months ended March 31, 2020 and 2019 were $9.5 million and $4.5 million, respectively, with the increase largely related to the ongoing plant expansions at our Vactor and Rugby facilities. During the three months ended March 31, 2020, the Company also received $0.8 million as part of the finalization of certain post-closing adjustments in connection with the acquisition of MRL.

Net cash of $41.4 million was provided by financing activities in the three months ended March 31, 2020, whereas in the prior-year period, $1.4 million of net cash was used for financing activities. In the three months ended March 31, 2020, the Company borrowed $63.6 million against its revolving credit facility, primarily to bolster the Company’s cash position in the short-term in light of the current uncertainty relating to the COVID-19 pandemic. The Company also funded cash dividends and share repurchases of $4.8 million and $13.5 million, respectively, and redeemed $4.0 million of stock in order to remit funds to tax authorities to satisfy employees' tax withholdings following the vesting of stock-based compensation. In the three months ended March 31, 2019, the Company borrowed $5.5 million against its revolving credit facility. The Company also funded cash dividends and share repurchases of $4.8 million and $1.0 million, respectively, and redeemed $1.1 million of stock in order to remit funds to tax authorities to satisfy employees' tax withholdings following the vesting of stock-based compensation.

The Company is subject to certain net leverage ratio and interest coverage ratio financial covenants under the 2019 Credit Agreement that are to be measured at each fiscal quarter-end. The Company was in compliance with all such covenants as of March 31, 2020.

The Company currently anticipates that capital expenditures for 2020, including investments associated with its ongoing plant expansions, will be in the range of $25 million to $30 million. While this range reflects the Company's decision to temporarily delay certain non-essential capital expenditures, actual capital expenditures for 2020 may differ materially depending on the duration and severity of the COVID-19 pandemic and its resulting impact on the Company's liquidity.

Contractual Obligations and Off-Balance Sheet Arrangements

During the three months ended March 31, 2020, there have been no material changes in the Company's contractual obligations and off-balance sheet arrangements as described in Item 7, *Management's Discussion and Analysis of Financial Condition and Results of Operations*, of the Company's Annual Report on Form 10-K for the year ended December 31, 2019.

Item 3. ***Quantitative and Qualitative Disclosures about Market Risk.***

See Item 7A, *Quantitative and Qualitative Disclosures about Market Risk*, of the Company's Annual Report on Form 10-K for the year ended December 31, 2019. During the three months ended March 31, 2020, there have been no significant changes in our exposure to market risk.

Item 4. ***Controls and Procedures.***

As required by Rule 13a-15 under the Exchange Act, the Company's management, with the participation of the Company's Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of the design and operation of the Company's disclosure controls and procedures (as defined in Rule 13a-15(e) or Rule 15d-15(e) under the Exchange Act) as of March 31, 2020. Based on that evaluation, the Company's Chief Executive Officer and Chief Financial Officer concluded that the Company's disclosure controls and procedures were effective as of March 31, 2020.

As a matter of practice, the Company's management continues to review and document internal control and procedures for financial reporting. From time to time, the Company may make changes aimed at enhancing the effectiveness of the controls and ensuring that the systems evolve with the business. There were no changes in the Company's internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting during the three months ended March 31, 2020.

PART II. OTHER INFORMATION

Item 1. *Legal Proceedings.*

The information set forth under the heading "Legal Proceedings" in Note 7 – Commitments and Contingencies to the accompanying condensed consolidated financial statements as included in Part I of this Form 10-Q is incorporated herein by reference.

Item 1A. *Risk Factors.*

There have been no material changes in the Company's risk factors as described in Item 1A, *Risk Factors*, of the Company's Annual Report on Form 10-K for the year ended December 31, 2019, except as described below.

The extent to which the COVID-19 pandemic will adversely impact our business, financial condition and operating results is highly uncertain and cannot be predicted but could be material.

The COVID-19 pandemic has created significant worldwide volatility, uncertainty and disruption. In particular, the COVID-19 pandemic and the governmental response to the pandemic has resulted in a substantial curtailment of business activities, a significant number of business closures, slowdowns, suspensions or delays of production and commercial activity, and weakened economic conditions, both in the United States and many foreign countries. As such, the COVID-19 pandemic has directly and indirectly adversely impacted the Company and such adverse impact will likely continue. However, the extent to which the COVID-19 pandemic will ultimately adversely impact the Company's business, financial condition and operating results, which could be material, will depend on numerous evolving factors that are highly uncertain, rapidly changing and cannot be predicted at this time, including:

- the duration and scope of the COVID-19 pandemic?
- governmental, business and individual actions that have been, and continue to be, taken in response to the COVID-19 pandemic, including business and travel restrictions, "stay-at-home" and "shelter-in-place" directives, quarantines, and slowdowns, suspensions or delays of commercial activity;
- the effect of the COVID-19 pandemic and the government response on our dealers, distributors and other channel partners and customers, including their ability to remain open, continue to sell and service our products, pay for the products purchased from us and obtain vehicle chassis, to the extent that they source such components directly;
- the effect of the COVID-19 pandemic and the governmental response on the budgets of our municipal customers;
- our ability to continue to run our operations as an essential business during the COVID-19 pandemic and/or to maintain our normal production capacity, in light of the potential for adverse impacts associated with decreased labor availability, the temporary suspension of production activity mandated or otherwise made necessary by governmental authorities, weakened demand, supply chain disruptions, or other production delays;
- significant reductions or volatility in demand for one or more of our products or services;
- the effect of the COVID-19 pandemic on our suppliers and our ability to obtain commodities, components and parts, on a timely basis through our supply chain and at previously anticipated costs;
- logistics costs and challenges, including availability of transportation and at previously anticipated costs;
- costs incurred as a result of necessary actions and preparedness plans to help ensure the health and safety of our employees and continued operations, including remote working accommodations, enhanced cleaning processes, protocols designed to implement appropriate social distancing practices, and/or adoption of additional wage and benefit programs to assist employees;
- potential future restructuring, impairment and other charges;
- availability of employees, their ability to conduct work away from normal working locations and/or under revised work environment protocols and the general willingness of employees to come to and perform work;
- the impact of the COVID-19 pandemic on the financial and credit markets and economic activity generally?
- our ability to access lending, capital markets, and other sources of liquidity when needed on reasonable terms or at all?
- our ability to comply with the financial covenants in our debt agreements if a material economic downturn as a result of the COVID-19 pandemic results in substantially increased indebtedness and/or lower earnings? and
- the exacerbation of negative impacts resulting from the occurrence of a global or national recession, depression or other sustained adverse market event as a result of the COVID-19 pandemic.

In addition to its potential to cause a direct adverse affect on our business, operations, financial condition and operating results, the COVID-19 pandemic may also have the effect of heightening many of the other risks described in Item 1A, *Risk Factors*, of the Company's Annual Report on Form 10-K for the year ended December 31, 2019.

Item 2. ***Unregistered Sales of Equity Securities and Use of Proceeds.***

The following table provides a summary of the Company's repurchase activity for its common stock during the three months ended March 31, 2020:

Period	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Dollar Value of Shares That May Yet Be Purchased Under the Plans or Programs (a) (b)
January 2020 (1/1/20 – 2/1/20)	—	$ —	—	$ 29,198,155
February 2020 (2/2/20 – 2/29/20)	—	—	—	29,198,155
March 2020 (3/1/20 – 3/28/20)	490,990	27.4422	490,990	90,724,309

(a) On November 4, 2014, the Board authorized a stock repurchase program of up to $75.0 million of the Company's common stock.
(b) On March 13, 2020, the Board authorized an additional stock repurchase program of up to $75.0 million of the Company's common stock. This program supplements the November 2014 stock repurchase program, which remains in effect.

In light of the current uncertainty and volatility resulting from the COVID-19 pandemic, the Company has elected to suspend stock repurchases but may resume such repurchases in the future.

Item 3. ***Defaults upon Senior Securities.***

None.

Item 4. ***Mine Safety Disclosures.***

Not applicable.

Item 5. ***Other Information.***

Other Events

On April 29, 2020, the Company issued a press release announcing its financial results for the three months ended March 31, 2020. The presentation slides for the first quarter 2020 earnings call were also posted on the Company's website at that time. The full text of the first quarter financial results press release and earnings presentation are attached hereto as Exhibits 99.1 and 99.2, respectively, to this Form 10-Q.

Reduction in Officer and Director Compensation

On April 27, 2020, the Company's Compensation and Benefits Committee (the "Committee") of the Board and Jennifer L. Sherman, President and Chief Executive Officer, each of the Company's other named executive officers included in the Company's most recent proxy statement (the "2020 Proxy Statement") filed with the SEC on March 12, 2020 (Mark D. Weber, Senior Vice President and Chief Operating Officer, Ian A. Hudson, Senior Vice President and Chief Financial Officer, Robert E. Fines, Vice President and General Manager of Truck Bodies and Equipment International, and Daniel A. DuPré, Vice President and General Counsel), and certain other executive officers of the Company agreed to voluntary reductions in such executive officers' base salaries for a period of ten consecutive weeks beginning on, or around, April 16, 2020. Each of the Company's non-employee directors also agreed to corresponding reductions in cash compensation for the same period. The Company's officers and directors volunteered these reductions in compensation to support the Company's cost reduction efforts in response to the economic impact of the current COVID-19 pandemic.

As a result of these reductions, for a period of ten consecutive weeks beginning on, or around, April 16, 2020:

- Ms. Sherman's base salary will be reduced by 25%;
- The base salaries of Mr. Weber and Mr. Hudson will be reduced by 22.5%;
- Each of the other named executive officers' base salaries will be reduced by 20%;
- Each of the other executive officers' base salaries will be reduced by 20%;
- As Chairman of the Board, Dennis J. Martin's annual retainer will be reduced by 25%; and
- All other non-employee directors' annual retainers will be reduced by 22.5%.

At the end of the ten-week period, the compensation in effect before the reductions will be reinstated without further action by the Committee or the Board.

Item 6. ***Exhibits.***

3.1	Restated Certificate of Incorporation of the Company. Incorporated by reference to Exhibit 3.1 to the Company's Form 8-K filed April 30, 2010.
3.2	Amended and Restated By-laws of the Company. Incorporated by reference to Exhibit 3.1 to the Company's Form 8-K filed February 9, 2016.
10.1*	Seventh Amendment to Federal Signal Corporation Savings Restoration Plan, effective as of January 1, 2020. Incorporated by reference to Exhibit 10.ccc to the Company's Form 10-K for the year ended December 31, 2019.
31.1	CEO Certification under Section 302 of the Sarbanes-Oxley Act.
31.2	CFO Certification under Section 302 of the Sarbanes-Oxley Act.
32.1	CEO Certification of Periodic Report under Section 906 of the Sarbanes-Oxley Act.
32.2	CFO Certification of Periodic Report under Section 906 of the Sarbanes-Oxley Act.
99.1	First Quarter Financial Results Press Release, Dated April 29, 2020.
99.2	First Quarter Earnings Call Presentation Slides.
101.INS	XBRL Instance Document (the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document).
101.SCH	Inline XBRL Taxonomy Extension Schema Document.
101.CAL	Inline XBRL Taxonomy Calculation Linkbase Document.
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document.
101.LAB	Inline XBRL Taxonomy Label Linkbase Document.
101.PRE	Inline XBRL Taxonomy Presentation Linkbase Document.
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101).

* Management contract or compensatory plan or arrangement.

SIGNATURE

Pursuant to the requirements of Section 13 or 15 (d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Federal Signal Corporation

Date: April 29, 2020

/s/ Ian A. Hudson

Ian A. Hudson

Senior Vice President and Chief Financial Officer
(Principal Financial Officer)

EXHIBIT 31.1

CEO Certification under Section 302 of the Sarbanes-Oxley Act

I, Jennifer L. Sherman, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Federal Signal Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)), for the registrant and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: April 29, 2020

/s/ Jennifer L. Sherman

Jennifer L. Sherman

President and Chief Executive Officer

(Principal Executive Officer)

EXHIBIT 31.2

CFO Certification under Section 302 of the Sarbanes-Oxley Act

I, Ian A. Hudson, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Federal Signal Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)), for the registrant and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: April 29, 2020

/s/ Ian A. Hudson

Ian A. Hudson

Senior Vice President and Chief Financial Officer

(Principal Financial Officer)

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002
(18 U.S.C. SECTION 1350)

In connection with the Quarterly Report of Federal Signal Corporation (the “Company”) on Form 10-Q for the period ended March 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Jennifer L. Sherman, President and Chief Executive Officer of the Company, certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (15 U.S.C. 78m or 78o (d)); and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 29, 2020

/s/ Jennifer L. Sherman

Jennifer L. Sherman
President and Chief Executive Officer
(*Principal Executive Officer)*

This certification accompanies the Report pursuant to § 906 of the Sarbanes-Oxley Act of 2002 and shall not be deemed filed by the Company for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liability of that section. This certification shall also not be deemed to be incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Securities Exchange act of 1934, as amended, except to the extent that the Company specifically incorporates it by reference.

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002
(18 U.S.C. SECTION 1350)

In connection with the Quarterly Report of Federal Signal Corporation (the “Company”) on Form 10-Q for the period ended March 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Ian A. Hudson, Senior Vice President and Chief Financial Officer of the Company, certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (15 U.S.C. 78m or 78o (d)); and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: April 29, 2020

/s/ Ian A. Hudson

Ian A. Hudson
Senior Vice President and Chief Financial Officer
(Principal Financial Officer)

This certification accompanies the Report pursuant to § 906 of the Sarbanes-Oxley Act of 2002 and shall not be deemed filed by the Company for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liability of that section. This certification shall also not be deemed to be incorporated by reference into any filing under the Securities Act of 1933, as amended, or the Securities Exchange act of 1934, as amended, except to the extent that the Company specifically incorporates it by reference.

FEDERAL SIGNAL
Moves. Cleans. Protects.

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Oak Brook, Illinois 60523
630.954.2000
federalsignal.com

FOR IMMEDIATE RELEASE

Federal Signal Reports Strong Start to 2020 with First Quarter Operating Income up 25%

Oak Brook, Illinois, April 29, 2020 — Federal Signal Corporation (NYSE:FSS) (the "Company"), a leader in environmental and safety solutions, today reported results for the first quarter ended March 31, 2020.

- Net sales of $286 million, up $12 million, or 4%, from last year
- Operating income of $32.3 million, up $6.5 million, or 25%, from last year
- GAAP EPS of $0.38, up $0.09, or 31%, from last year
- Adjusted EPS of $0.39, up $0.09, or 30%, from last year
- Orders of $304 million, up $5 million, or 2%, from last year
- Record backlog of $401 million, up $37 million, or 10%, from last year
- Operating cash flow of $5.2 million, up $14.0 million from last year
- Cash and cash equivalents of $69 million, and $211 million of availability under revolving credit facility

Consolidated net sales for the first quarter were $286.1 million, up $12.3 million, or 4%, versus the same quarter a year ago. Net income for the first quarter was $23.4 million, equal to $0.38 per diluted share, compared to $17.5 million, equal to $0.29 per share, in the prior-year quarter.

The Company also reported adjusted net income for the first quarter of $24.1 million, equal to $0.39 per diluted share, up from $18.1 million, or $0.30 per diluted share, in the first quarter of last year. The Company is reporting adjusted results to facilitate comparisons of underlying performance on a year-over-year basis. A reconciliation of these and other non-GAAP measures is provided at the conclusion of this news release.

Q1 Represents Strong Start to 2020, with Year-over-Year Improvement in Sales, Income and Orders

"Our first-quarter results represent a strong start to the year, and our teams did a tremendous job in delivering year-over-year improvement in exceptionally difficult circumstances," commented Jennifer L. Sherman, President and Chief Executive Officer. "On a consolidated basis, our net sales were up 4% compared to last year, and our operating income improved by 25%. Our adjusted EBITDA margin for the first quarter was 15.3%, towards the high end of our target range and up 220 basis points from last year. We also reported a 2% improvement in orders, contributing to a record backlog at the end of the quarter."

In the Environmental Solutions Group, net sales for the first quarter were $233.0 million, up $13.5 million, or 6%, compared to the prior-year quarter, while in the Safety and Security Systems Group, net sales were $53.1 million, down $1.2 million, or 2%, compared to the prior-year quarter.

Consolidated operating income for the first quarter was $32.3 million, up $6.5 million, or 25%, compared to the prior-year quarter, primarily driven by a $3.7 million increase within the Environmental Solutions Group and lower corporate expenses. Consolidated operating margin was 11.3%, up from 9.4% in the prior-year quarter.

Consolidated adjusted earnings before interest, tax, depreciation and amortization ("adjusted EBITDA") for the first quarter was $43.9 million, up $8.0 million, or 22%, compared to the prior-year quarter, and consolidated adjusted EBITDA margin was 15.3%, compared to 13.1% last year.

Adjusted EBITDA in the Environmental Solutions Group was $40.0 million, up $5.3 million, or 15%, from the prior-year quarter, and its adjusted EBITDA margin was 17.2%, up from 15.8%. Within the Safety and Security Systems Group, adjusted EBITDA was $8.2 million, down $1.4 million from the prior-year quarter, and its adjusted EBITDA margin was 15.4%, compared to 17.7%.

Consolidated orders for the first quarter were $303.9 million, up $4.9 million, or 2%, compared to the prior-year quarter, contributing to a consolidated backlog of $401 million at March 31, 2020, which represented a new record for the Company, and an increase of $37 million, or 10%, compared to the prior-year quarter.

Improvement in Operating Cash Flow Support Cash Returns to Stockholders; Financial Position Remains Strong

Net cash of $5.2 million was provided by operating activities during the first quarter, compared to operating cash usage of $8.8 million in the prior-year quarter. At March 31, 2020, consolidated debt was $279 million, total cash and cash equivalents were $69 million and the Company had $211 million of availability for borrowings under its five-year revolving credit facility, which was executed in July 2019.

"Our operating cash flow improved by $14 million in comparison to the prior-year quarter," said Sherman. "However, like many other companies, we expect that the next few quarters may be challenging. We are responding accordingly, by taking actions to reduce our costs and preserve liquidity in the short-term. We are approaching the uncertainty and challenges with resolve and from a position of strength given our current financial position, and we remain steadfast in our commitment to add long-term value to our stockholders."

The Company funded dividends of $4.8 million during the first quarter, reflecting a dividend of $0.08 per share, and the Board of Directors recently declared a similar dividend that will be payable in the second quarter. In addition, during the first quarter the Company repurchased $13.5 million of stock under its authorized repurchase programs.

COVID-19 Update and Outlook

"Our businesses are considered to be essential in supporting critical infrastructure needs and public safety. While certain of our operations have been affected by temporary facility closures, either due to government-issued mandates or other concerns related to COVID-19, our facilities have so far remained substantially operational during the pandemic. Given that, our primary focus has been on the safety and wellbeing of our employees," noted Sherman.

"We were proactive in implementing enhanced health and safety measures across the organization, establishing remote working arrangements, where possible, and increasing the frequency of communications to reinforce health and safety guidelines. We also modified our employee attendance policies and provided employees with additional paid time off in order to encourage those who were sick, had health concerns, or were otherwise adversely impacted by the pandemic, to remain at home.

As a result of the combination of these factors and the enactment of the Coronavirus Aid, Relief, and Economic Security Act, in recent weeks we have experienced a decrease in labor availability at several of our facilities. This has resulted in a variety of challenges in running our operations efficiently, which has adversely affected productivity levels. We are also seeing similar issues within our supply chain, with certain suppliers temporarily shut down. In addition, certain customers are unable to take delivery of equipment given the limited personnel that they currently have available. Although these factors had a limited impact on our first-quarter results, we are expecting a more significant impact in the second quarter as we adjust our production schedules accordingly.

The overall magnitude of the impact of the pandemic on our current-year results remains uncertain, and will largely depend on the duration of the pandemic and the measures implemented in response, as well as the effect on our customers. Given these factors, we are unable to reliably forecast the effect that the pandemic will have on our financial results. As a result, we are withdrawing our previously-issued adjusted EPS* outlook for 2020. Our intent is to provide a further update on our second-quarter earnings call."

CONFERENCE CALL

Federal Signal will host its first quarter conference call on Wednesday, April 29, 2020 at 10:00 a.m. Eastern Time. The call will last approximately one hour. The call may be accessed over the internet through Federal Signal's website at www.federalsignal.com or by dialing phone number 1-877-705-6003 and entering the pin number 13702373. A replay will be available on Federal Signal's website shortly after the call.

About Federal Signal

Federal Signal Corporation (NYSE: FSS) builds and delivers equipment of unmatched quality that moves material, cleans infrastructure, and protects the communities where we work and live. Founded in 1901, Federal Signal is a leading global designer, manufacturer and supplier of products and total solutions that serve municipal, governmental, industrial and commercial customers. Headquartered in Oak Brook, Ill., with manufacturing facilities worldwide, the Company operates two groups: Environmental Solutions and Safety and Security Systems. For more information on Federal Signal, visit: www.federalsignal.com.

“Safe Harbor” Statement under the Private Securities Litigation Reform Act of 1995

This release contains unaudited financial information and various forward-looking statements as of the date hereof and we undertake no obligation to update these forward-looking statements regardless of new developments or otherwise. Statements in this release that are not historical are forward-looking statements. Such statements are subject to various risks and uncertainties that could cause actual results to vary materially from those stated. Such risks and uncertainties include but are not limited to: direct and indirect impacts of the coronavirus pandemic and the associated government response, economic conditions in various regions, product and price competition, supply chain disruptions, work stoppages, availability and pricing of raw materials, risks associated with acquisitions such as integration of operations and achieving anticipated revenue and cost benefits, foreign currency exchange rate changes, interest rate changes, increased legal expenses and litigation results, legal and regulatory developments and other risks and uncertainties described in filings with the Securities and Exchange Commission.

Contact: Ian Hudson, Chief Financial Officer, +1-630-954-2000, ihudson@federalsignal.com

* Adjusted earnings per share (“EPS”) is a non-GAAP measure, which includes certain adjustments to reported GAAP net income and diluted EPS. When reporting adjusted EPS in 2020, we have made, and would expect to continue to make, certain adjustments to exclude the impact of acquisition and integration-related expenses, coronavirus-related expenses and purchase accounting effects, where applicable. In prior years, we have also made adjustments to GAAP net income and diluted EPS for hearing loss settlement charges and special tax items. Should any similar items occur in 2020, we would also expect to exclude them from the determination of adjusted EPS.

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS (Unaudited)

(in millions, except per share data)	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Net sales	$ 286.1	$ 273.8
Cost of sales	211.3	203.5
Gross profit	74.8	70.3
Selling, engineering, general and administrative expenses	42.2	43.9
Acquisition and integration-related expenses	0.3	0.6
Operating income	32.3	25.8
Interest expense	1.5	2.0
Other expense, net	0.2	0.4
Income before income taxes	30.6	23.4
Income tax expense	7.2	5.9
Net income	$ 23.4	$ 17.5
Earnings per share:		
Basic	$ 0.39	$ 0.29
Diluted	$ 0.38	$ 0.29
Weighted average common shares outstanding:		
Basic	60.5	60.1
Diluted	61.7	61.2
Cash dividends declared per common share	$ 0.08	$ 0.08
Operating data:		
Operating margin	11.3%	9.4%
Adjusted EBITDA	$ 43.9	$ 35.9
Adjusted EBITDA margin	15.3%	13.1%
Total orders	$ 303.9	$ 299.0
Backlog	400.8	363.5
Depreciation and amortization	10.8	9.5

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED BALANCE SHEETS

(in millions, except per share data)	March 31, 2020 (Unaudited)	December 31, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$ 69.4	$ 31.6
Accounts receivable, net of allowances for doubtful accounts of $2.3 and $2.4, respectively	141.4	134.2
Inventories	201.4	182.9
Prepaid expenses and other current assets	10.7	12.0
Total current assets	422.9	360.7
Properties and equipment, net of accumulated depreciation of $127.5 and $125.5, respectively	98.1	91.9
Rental equipment, net of accumulated depreciation of $34.6 and $33.6, respectively	115.9	115.4
Operating lease right-of-use assets	25.8	27.6
Goodwill	387.9	388.8
Intangible assets, net of accumulated amortization of $24.5 and $22.1, respectively	159.8	162.9
Deferred tax assets	9.2	10.0
Deferred charges and other long-term assets	7.2	7.9
Long-term assets of discontinued operations	0.3	0.3
Total assets	$ 1,227.1	$ 1,165.5
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of long-term borrowings and finance lease obligations	$ 0.2	$ 0.2
Accounts payable	78.0	65.0
Customer deposits	15.6	11.5
Accrued liabilities:		
Compensation and withholding taxes	23.0	31.1
Other current liabilities	50.1	52.2
Current liabilities of discontinued operations	0.2	0.2
Total current liabilities	167.1	160.2
Long-term borrowings and finance lease obligations	278.7	220.3
Long-term operating lease liabilities	19.8	21.6
Long-term pension and other postretirement benefit liabilities	48.9	50.9
Deferred tax liabilities	54.3	52.7
Other long-term liabilities	21.2	17.3
Long-term liabilities of discontinued operations	0.9	0.9
Total liabilities	590.9	523.9
Stockholders' equity:		
Common stock, $1 par value per share, 90.0 shares authorized, 67.2 and 66.9 shares issued, respectively	67.2	66.9
Capital in excess of par value	230.1	228.6
Retained earnings	546.8	528.2
Treasury stock, at cost, 7.0 and 6.4 shares, respectively	(111.4)	(93.0)
Accumulated other comprehensive loss	(96.5)	(89.1)
Total stockholders' equity	636.2	641.6
Total liabilities and stockholders' equity	$ 1,227.1	$ 1,165.5

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS (Unaudited)

(in millions)	Three Months Ended March 31, 2020	Three Months Ended March 31, 2019
Operating activities:		
Net income	$ 23.4	$ 17.5
Adjustments to reconcile net income to net cash provided by (used for) operating activities:		
Net gain on sales of properties and equipment	(0.2)	—
Depreciation and amortization	10.8	9.5
Deferred financing costs	0.1	0.1
Stock-based compensation expense	1.0	1.4
Pension (benefit) expense, net of funding	(0.4)	(0.1)
Changes in fair value of contingent consideration and deferred payment	—	0.3
Deferred income taxes	2.8	1.2
Changes in operating assets and liabilities	(32.3)	(38.7)
Net cash provided by (used for) operating activities	5.2	(8.8)
Investing activities:		
Purchases of properties and equipment	(9.5)	(4.5)
Proceeds from sales of properties and equipment	0.3	—
Proceeds from acquisition-related activity	0.8	—
Net cash used for investing activities	(8.4)	(4.5)
Financing activities:		
Increase in revolving lines of credit, net	63.6	5.5
Purchases of treasury stock	(13.5)	(1.0)
Redemptions of common stock to satisfy withholding taxes related to stock-based compensation	(4.0)	(1.1)
Cash dividends paid to stockholders	(4.8)	(4.8)
Other, net	0.1	—
Net cash provided by (used for) financing activities	41.4	(1.4)
Effects of foreign exchange rate changes on cash and cash equivalents	(0.4)	—
Increase (decrease) in cash and cash equivalents	37.8	(14.7)
Cash and cash equivalents at beginning of year	31.6	37.4
Cash and cash equivalents at end of period	$ 69.4	$ 22.7

FEDERAL SIGNAL CORPORATION AND SUBSIDIARIES

GROUP RESULTS (Unaudited)

The following tables summarize group operating results as of and for the three months ended March 31, 2020 and 2019:

Environmental Solutions Group

	Three Months Ended March 31,		
($ in millions)	**2020**	**2019**	**Change**
Net sales	$ 233.0	$ 219.5	$ 13.5
Operating income	29.4	25.7	3.7
Adjusted EBITDA	40.0	34.7	5.3
Operating data:			
Operating margin	12.6%	11.7%	0.9%
Adjusted EBITDA margin	17.2%	15.8%	1.4%
Total orders	$ 237.5	$ 243.7	$ (6.2)
Backlog	358.4	335.4	23.0
Depreciation and amortization	10.0	8.6	1.4

Safety and Security Systems Group

	Three Months Ended March 31,		
($ in millions)	**2020**	**2019**	**Change**
Net sales	$ 53.1	$ 54.3	$ (1.2)
Operating income	7.4	8.7	(1.3)
Adjusted EBITDA	8.2	9.6	(1.4)
Operating data:			
Operating margin	13.9%	16.0%	(2.1)%
Adjusted EBITDA margin	15.4%	17.7%	(2.3)%
Total orders	$ 66.4	$ 55.3	$ 11.1
Backlog	42.4	28.1	14.3
Depreciation and amortization	0.8	0.9	(0.1)

Corporate Expenses

Corporate operating expenses were $4.5 million and $8.6 million for the three months ended March 31, 2020 and 2019, respectively.

SEC REGULATION G NON-GAAP RECONCILIATION

The financial measures presented below are unaudited and are not in accordance with U.S. generally accepted accounting principles ("GAAP"). The non-GAAP financial information presented herein should be considered supplemental to, and not a substitute for, or superior to, financial measures calculated in accordance with GAAP. The Company has provided this supplemental information to investors, analysts, and other interested parties to enable them to perform additional analyses of operating results, to illustrate the results of operations giving effect to the non-GAAP adjustments shown in the reconciliations below, and to provide an additional measure of performance which management considers in operating the business.

Adjusted Net Income and Earnings Per Share ("EPS"):

The Company believes that modifying its 2020 and 2019 net income and diluted EPS provides additional measures which are representative of the Company's underlying performance and improves the comparability of results across reporting periods. During the three months ended March 31, 2020 and 2019 adjustments were made to reported GAAP net income and diluted EPS to exclude the impact of acquisition and integration-related expenses, coronavirus-related expenses and purchase accounting effects, where applicable.

	Three Months Ended March 31,	
(in millions)	**2020**	**2019**
Net income	$ 23.4	$ 17.5
Add:		
Income tax expense	7.2	5.9
Income before income taxes	30.6	23.4
Add:		
Acquisition and integration-related expenses	0.3	0.6
Coronavirus-related expenses [(a)]	0.4	—
Purchase accounting effects [(b)]	0.2	0.1
Adjusted income before income taxes	31.5	24.1
Adjusted income tax expense [(c)]	(7.4)	(6.0)
Adjusted net income	$ 24.1	$ 18.1

	Three Months Ended March 31,	
(dollars per diluted share)	**2020**	**2019**
EPS, as reported	$ 0.38	$ 0.29
Add:		
Income tax expense	0.12	0.10
Income before income taxes	0.50	0.39
Add:		
Acquisition and integration-related expenses	0.00	0.01
Coronavirus-related expenses [(a)]	0.01	—
Purchase accounting effects [(b)]	0.00	0.00
Adjusted income before income taxes	0.51	0.40
Adjusted income tax expense [(c)]	(0.12)	(0.10)
Adjusted EPS	$ 0.39	$ 0.30

(a) Coronavirus-related expenses in the three months ended March 31, 2020 relate to direct expenses incurred in connection with the Company's response to the coronavirus pandemic, that are incremental to, and separable from, normal operations.

(b) Purchase accounting effects relate to adjustments to exclude the step-up in the valuation of acquired JJE equipment that was sold subsequent to the acquisition in the three months ended March 31, 2020 and 2019, as well as to exclude the depreciation of the step-up in the valuation of the rental fleet acquired.

(c) Adjusted income tax expense for the three months ended March 31, 2020 and 2019 was recomputed after excluding the impact of acquisition and integration-related expenses, coronavirus-related expenses and purchase accounting effects, where applicable.

Adjusted EBITDA and Adjusted EBITDA Margin:

The Company uses adjusted EBITDA and the ratio of adjusted EBITDA to net sales ("adjusted EBITDA margin"), at both the consolidated and segment level, as additional measures which are representative of its underlying performance and to improve the comparability of results across reporting periods. We believe that investors use versions of these metrics in a similar manner. For these reasons, the Company believes that adjusted EBITDA and adjusted EBITDA margin, at both the consolidated and segment level, are meaningful metrics to investors in evaluating the Company's underlying financial performance.

Consolidated adjusted EBITDA is a non-GAAP measure that represents the total of net income, interest expense, acquisition and integration-related expenses, coronavirus-related expenses, purchase accounting effects, other income/expense, income tax expense, and depreciation and amortization expense. Consolidated adjusted EBITDA margin is a non-GAAP measure that represents the total of net income, interest expense, acquisition and integration-related expenses, coronavirus-related expenses, purchase accounting effects, other income/expense, income tax expense, and depreciation and amortization expense divided by net sales for the applicable period(s).

Segment adjusted EBITDA is a non-GAAP measure that represents the total of segment operating income, acquisition and integration-related expenses, coronavirus-related expenses, purchase accounting effects and depreciation and amortization expense, as applicable. Segment adjusted EBITDA margin is a non-GAAP measure that represents the total of segment operating income, acquisition and integration-related expenses, coronavirus-related expenses, purchase accounting effects and depreciation and amortization expense, as applicable, divided by net sales for the applicable period(s). Segment operating income includes all revenues, costs and expenses directly related to the segment involved. In determining segment income, neither corporate nor interest expenses are included. Segment depreciation and amortization expense relates to those assets, both tangible and intangible, that are utilized by the respective segment.

Other companies may use different methods to calculate adjusted EBITDA and adjusted EBITDA margin.

Consolidated

The following table summarizes the Company's consolidated adjusted EBITDA and adjusted EBITDA margin and reconciles net income to consolidated adjusted EBITDA for the three months ended March 31, 2020 and 2019:

	Three Months Ended March 31,	
($ in millions)	**2020**	**2019**
Net income	$ 23.4	$ 17.5
Add:		
Interest expense	1.5	2.0
Acquisition and integration-related expenses	0.3	0.6
Coronavirus-related expenses	0.4	—
Purchase accounting effects*	0.1	—
Other expense, net	0.2	0.4
Income tax expense	7.2	5.9
Depreciation and amortization	10.8	9.5
Consolidated adjusted EBITDA	$ 43.9	$ 35.9
Net sales	$ 286.1	$ 273.8
Consolidated adjusted EBITDA margin	15.3%	13.1%

** Excludes purchase accounting expenses reflected in depreciation and amortization of $0.1 million and $0.1 million for the three months ended March 31, 2020 and 2019, respectively.*

Environmental Solutions Group

The following table summarizes the Environmental Solutions Group's adjusted EBITDA and adjusted EBITDA margin and reconciles operating income to adjusted EBITDA for the three months ended March 31, 2020 and 2019:

	Three Months Ended March 31,	
($ in millions)	**2020**	**2019**
Operating income	$ 29.4	$ 25.7
Add:		
Acquisition and integration-related expenses	0.1	0.4
Coronavirus-related expenses	0.4	—
Purchase accounting effects*	0.1	—
Depreciation and amortization	10.0	8.6
Adjusted EBITDA	$ 40.0	$ 34.7
Net sales	$ 233.0	$ 219.5
Adjusted EBITDA margin	17.2%	15.8%

** Excludes purchase accounting expenses reflected in depreciation and amortization of $0.1 million and $0.1 million for the three months ended March 31, 2020 and 2019, respectively.*

Safety and Security Systems Group

The following table summarizes the Safety and Security Systems Group's adjusted EBITDA and adjusted EBITDA margin and reconciles operating income to adjusted EBITDA for the three months ended March 31, 2020 and 2019:

	Three Months Ended March 31,	
($ in millions)	**2020**	**2019**
Operating income	$ 7.4	$ 8.7
Add:		
Coronavirus-related expenses	0.0	—
Depreciation and amortization	0.8	0.9
Adjusted EBITDA	$ 8.2	$ 9.6
Net sales	$ 53.1	$ 54.3
Adjusted EBITDA margin	15.4%	17.7%