

MKS INSTRUMENTS INC
Form DEF 14A
March 28, 2019
Table of Contents

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, DC 20549

SCHEDULE 14A

(Rule 14A-101)

INFORMATION REQUIRED IN

PROXY STATEMENT

SCHEDULE 14A INFORMATION

Proxy Statement Pursuant to Section 14(a) of the

Securities Exchange Act of 1934

(Amendment No.)

Filed by the Registrant

Filed by a Party other than the Registrant

Check the appropriate box:

Preliminary Proxy Statement

Confidential, for Use of the Commission Only (as permitted by Rule 14a-6(e)(2))

Definitive Proxy Statement

Definitive Additional Materials

Soliciting Material Pursuant to §240.14a-12

MKS Instruments, Inc.

(Name of Registrant as Specified in its Charter)

Payment of Filing Fee (Check the appropriate box):

No fee required.

4) Date Filed:

Table of Contents

MKS INSTRUMENTS, INC.

2 Tech Drive, Suite 201

Andover, Massachusetts 01810

March 28, 2019

Dear Shareholder:

You are cordially invited to attend the 2019 Annual Meeting of Shareholders of MKS Instruments, Inc. to be held on Wednesday, May 8, 2019 at 10:00 a.m., Eastern Time, at MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810.

The attached notice of Annual Meeting and proxy statement describe the business to be transacted at the Annual Meeting and provide additional information about us that you should know when voting your shares. The principal business at the Annual Meeting will be (i) the election of two Class II Directors, each for a three-year term, (ii) the approval, on an advisory basis, of executive compensation and (iii) the ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for the year ending December 31, 2019.

Whether or not you plan to attend the Annual Meeting, please carefully review the attached proxy materials and take the time to cast your vote. If you attend the Annual Meeting, you may vote in person if you wish, even if you have previously voted, in which case your proxy vote will be revoked.

On behalf of MKS, I would like to express our appreciation for your continued interest in our Company.

Sincerely,

GERALD G. COLELLA

Chief Executive Officer

Table of Contents

MKS INSTRUMENTS, INC.

2 Tech Drive, Suite 201

Andover, Massachusetts 01810

NOTICE OF 2019 ANNUAL MEETING OF SHAREHOLDERS

TO BE HELD ON MAY 8, 2019

To our Shareholders:

The 2019 Annual Meeting of Shareholders of MKS INSTRUMENTS, INC., a Massachusetts corporation, will be held on Wednesday, May 8, 2019 at 10:00 a.m., Eastern Time, at MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810 for the following purposes:

1. The election of two Class II Directors, each for a three-year term;
2. The approval, on an advisory basis, of executive compensation; and
3. The ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for the year ending December 31, 2019.

The shareholders will also act on any other business as may properly come before the meeting.

We provide access to our proxy materials over the Internet under the U.S. Securities and Exchange Commission's notice and access rules. As a result, we mail to our shareholders a Notice of Internet Availability of Proxy Materials, which we refer to as the Notice. We are mailing the Notice on or about March 28, 2019, and it contains instructions on how to access the proxy statement and our Annual Report for the fiscal year ended December 31, 2018, which we refer to as the 2018 Annual Report, over the Internet. The Notice also contains instructions on how each of our shareholders can receive a paper copy of our proxy materials, including this proxy statement, our 2018 Annual Report, and a form of proxy card or voting instruction card. All shareholders who do not receive the Notice, including shareholders who have previously requested to receive paper copies of proxy materials, will receive a paper copy of the proxy materials by mail unless they have previously requested delivery of proxy materials electronically.

The Board of Directors has fixed the close of business on March 6, 2019 as the record date for the determination of shareholders entitled to notice of, and to vote at, the Annual Meeting and any adjournment or postponement thereof. Your vote is important no matter how many shares you own. Whether you expect to attend the meeting or not, please vote your shares by using the Internet as described in the instructions included on your Notice, by calling the toll-free telephone number, or, if you received a paper copy of the proxy materials, by completing, signing, dating and returning your proxy card or voting instruction form. Your prompt response is necessary to ensure that your shares are represented at the meeting. You can change your vote and revoke your proxy any time before the polls close at the meeting by following the procedures described in the accompanying proxy statement.

If you would like to attend the Annual Meeting and your shares are held by a broker, bank or other nominee, you must bring to the Annual Meeting a letter from the nominee confirming your beneficial ownership of such shares. In order to vote your shares at the Annual Meeting, you must obtain from the nominee a proxy issued in your name. You must also bring a form of personal identification.

By Order of the Board of Directors,

RICHARD S. CHUTE

Secretary

Andover, Massachusetts

March 28, 2019

Table of Contents

TABLE OF CONTENTS

<u>PROXY STATEMENT</u>	1
<u>VOTING OF SECURITIES AND VOTES REQUIRED</u>	1
<u>PROPOSAL ONE ELECTION OF DIRECTORS</u>	3
<u>DIRECTORS</u>	3
<u>Agreements as to Nomination</u>	7
<u>PROPOSAL TWO ADVISORY VOTE ON EXECUTIVE COMPENSATION</u>	8
<u>PROPOSAL THREE RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED PUBLIC</u>	
<u>ACCOUNTING FIRM</u>	9
<u>CORPORATE GOVERNANCE</u>	9
<u>Board Independence</u>	9
<u>Board Leadership Structure</u>	9
<u>Communications from Shareholders</u>	10
<u>Code of Ethics</u>	10
<u>Board's Role in Risk Oversight</u>	10
<u>Transactions with Related Persons</u>	11
<u>Board of Director Meetings and Committees of the Board of Directors</u>	11
<u>Audit Committee</u>	12
<u>Compensation Committee</u>	12
<u>Compensation Risk Assessment</u>	13
<u>Compensation Committee Interlocks and Insider Participation</u>	13
<u>Nominating and Corporate Governance Committee</u>	13
<u>Director Candidates</u>	14
<u>DIRECTOR COMPENSATION</u>	15
<u>Cash Compensation</u>	15
<u>Equity Compensation</u>	15
<u>Mr. Bertucci</u>	15
<u>Director Compensation Table for 2018</u>	16
<u>SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE</u>	16
<u>AUDIT AND FINANCIAL ACCOUNTING OVERSIGHT</u>	17
<u>Audit Committee Report</u>	17
<u>Principal Accountant Fees and Services</u>	17
<u>Audit Fees</u>	17
<u>Audit-Related Fees</u>	18
<u>Tax Fees</u>	18
<u>All Other Fees</u>	18
<u>Pre-Approval Policy and Procedures</u>	18
<u>SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT</u>	19
<u>EXECUTIVE OFFICERS</u>	21
<u>EXECUTIVE COMPENSATION</u>	22
<u>Compensation Discussion and Analysis</u>	22
<u>Introduction</u>	22
<u>Executive Summary</u>	22
<u>Our Business</u>	22
<u>Company Performance in 2018 and Financial Highlights</u>	22

<u>2018 Compensation Outcomes</u>	23
<u>Consideration of 2018 Advisory Vote on Executive Compensation</u>	23
<u>Compensation Philosophy and Objectives</u>	24
<u>Elements of Compensation</u>	26
<u>Base Salary</u>	26
<u>Annual Cash Incentive Compensation</u>	26

Table of Contents

<u>Long-Term Equity Incentive Compensation</u>	29
<u>Supplemental Retirement Benefits</u>	30
<u>Perquisites</u>	30
<u>Severance and Change-in-Control Provisions</u>	30
<u>Transition and Retirement Agreement</u>	31
<u>Compensation of our Chief Executive Officer</u>	31
<u>Compensation of our Other Named Executive Officers</u>	31
<u>Compensation Consultant</u>	31
<u>Role of our Chief Executive Officer</u>	31
<u>Governance Policies</u>	32
<u>Stock Ownership Guidelines</u>	32
<u>Clawback Policy</u>	32
<u>Prohibition on Hedging and Pledging</u>	32
<u>Impact of Accounting and Tax on Executive Compensation</u>	32
<u>Impact of Code Section 162(m)</u>	32
<u>Impact of ASC 718</u>	33
<u>COMPENSATION COMMITTEE REPORT</u>	33
<u>EXECUTIVE COMPENSATION TABLES</u>	34
<u>Summary Compensation Table for 2018</u>	34
<u>CEO Pay Ratio</u>	36
<u>Grants of Plan-Based Awards Table in Fiscal Year 2018</u>	37
<u>Outstanding Equity Awards at 2018 Fiscal Year-End Table</u>	38
<u>Option Exercises and Stock Vested in Fiscal Year 2018 Table</u>	38
<u>Retirement and Post-Employment Tables</u>	39
<u>Pension Benefits</u>	39
<u>Non-Qualified Deferred Compensation</u>	39
<u>Potential Payments Upon Termination or Change-in-Control</u>	40
<u>Mr. Colella</u>	40
<u>Potential Payments Upon Termination or Change-in-Control Table – Gerald G. Colella</u>	43
<u>Other Named Executive Officers</u>	44
<u>Potential Payments Upon Termination or Change-in-Control Table – Other Named Executive Officers</u>	46
<u>EQUITY COMPENSATION PLAN INFORMATION</u>	48
<u>OTHER MATTERS</u>	49
<u>Electronic Voting</u>	49
<u>Expenses and Solicitation</u>	49
<u>Deadline for Submission of Shareholder Proposals for the 2020 Annual Meeting</u>	49

Table of Contents

MKS INSTRUMENTS, INC.

2 Tech Drive, Suite 201

Andover, Massachusetts 01810

PROXY STATEMENT

This proxy statement is furnished in connection with the solicitation of proxies by the Board of Directors of MKS Instruments, Inc., a Massachusetts corporation, for use at the 2019 Annual Meeting of Shareholders to be held on May 8, 2019 at 10:00 a.m., Eastern Time, at MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810, and at any adjournment or postponement thereof, which we refer to as the Annual Meeting. References in this proxy statement to we, us, the Company or MKS refer to MKS Instruments, Inc. and its consolidated subsidiaries.

All proxies will be voted in accordance with the applicable shareholder's instructions. If no choice is specified in the proxy, the shares will be voted in favor of the matters set forth in the accompanying Notice of 2019 Annual Meeting of Shareholders. Any proxy may be revoked by a shareholder at any time before its exercise by delivery of written revocation to the Secretary of MKS. Attendance at the Annual Meeting will not in itself be deemed to revoke a proxy unless the shareholder gives affirmative notice at the Annual Meeting that the shareholder intends to revoke the proxy and vote in person.

We provide access to our proxy materials over the Internet under the notice and access rules of the U.S. Securities and Exchange Commission, which we refer to as the SEC. As a result, we mail to our shareholders a Notice of Internet Availability of Proxy Materials, which we refer to as the Notice. We are mailing the Notice on or about March 28, 2019, and it contains instructions on how to access the proxy statement and our Annual Report for the fiscal year ended December 31, 2018, which we refer to as the 2018 Annual Report, over the Internet. The Notice also contains instructions on how each of our shareholders can receive a paper copy of our proxy materials, including this proxy statement, our 2018 Annual Report, and a form of proxy card or voting instruction card. All shareholders who do not receive the Notice, including shareholders who have previously requested to receive paper copies of proxy materials, will receive a paper copy of the proxy materials by mail unless they have previously requested delivery of proxy materials electronically.

IMPORTANT NOTICE REGARDING THE AVAILABILITY OF PROXY MATERIALS FOR THE ANNUAL MEETING OF SHAREHOLDERS TO BE HELD ON MAY 8, 2019

This proxy statement and the 2018 Annual Report to Shareholders are available for viewing, printing and downloading at <http://investor.mksinst.com/financial-information/annual-reports>.

A COPY OF OUR ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2018 AS FILED WITH THE SEC, EXCLUDING EXHIBITS, WILL BE FURNISHED WITHOUT CHARGE TO ANY SHAREHOLDER UPON WRITTEN REQUEST TO: INVESTOR RELATIONS DEPARTMENT, MKS INSTRUMENTS, INC., 2 TECH DRIVE, SUITE 201, ANDOVER, MA 01810. EXHIBITS WILL BE PROVIDED UPON WRITTEN REQUEST AND PAYMENT OF AN APPROPRIATE PROCESSING FEE.

VOTING OF SECURITIES AND VOTES REQUIRED

At the close of business on March 6, 2019, the record date for the determination of shareholders entitled to notice of, and to vote at, the Annual Meeting, there were issued and outstanding and entitled to vote 54,224,964 shares of our

common stock, no par value per share, which we refer to as our Common Stock. Each outstanding share entitles the record holder to one vote on each matter submitted at the Annual Meeting.

In order to transact business at the Annual Meeting, we must have a quorum. Under our Amended and Restated By-Laws, the holders of a majority of the shares of Common Stock issued and outstanding and entitled to vote at the Annual Meeting shall constitute a quorum for the transaction of business at the Annual Meeting. Shares of Common Stock held by shareholders present in person or represented by proxy (including broker non-votes and shares that abstain or do not vote with respect to a particular proposal to be voted upon) will be counted for purposes of determining whether a quorum exists at the Annual Meeting. If a quorum is not present, the meeting will be adjourned until a quorum is obtained.

Table of Contents

The affirmative vote of the holders of a plurality of the votes cast on the matter is required for the election of directors (Proposal One); provided, however, any director nominee who receives a greater number of withhold votes than affirmative votes, which we refer to as a Majority Withhold Vote, in an uncontested election must offer to tender to the Board of Directors his or her resignation promptly following the certification of election results. The Board of Directors must accept or reject a resignation within 90 days following the certification of election results and publicly disclose its decision. Accordingly, the nominees who receive the highest number of votes of the shares present, in person or by proxy, and entitled to vote shall be elected to the available Class II Director positions, and in the event any nominee receives a Majority Withhold Vote, the resignation policy will apply as summarized here and as set forth in Section B.4 of our Corporate Governance Guidelines which are posted on our website at investor.mksinst.com in the Corporate Governance tab. The advisory vote on executive compensation (Proposal Two) and the ratification of PricewaterhouseCoopers LLP (Proposal Three) require the affirmative vote of the holders of a majority of the votes cast on the matter. Proposal Two is a non-binding proposal.

Shares held by shareholders who abstain from voting as to a particular matter, and broker non-votes, which are shares held in street name by banks, brokers or nominees, who indicate on their proxies that they do not have discretionary authority to vote such shares as to a particular non-routine matter, including the election of directors and the advisory vote on executive compensation, will not be counted as votes in favor of, or as votes cast for, a matter. Accordingly, abstentions and broker non-votes will have no effect on the voting on a matter that requires the affirmative vote of a majority of the votes cast on the matter. If the shares you own are held in street name by a bank or brokerage firm, your bank or brokerage firm, as the record holder of your shares, is required to vote your shares according to your instructions. In order to vote your shares, you will need to follow the directions your bank or brokerage firm provides you.

Table of Contents**PROPOSAL ONE ELECTION OF DIRECTORS**

Our Amended and Restated By-Laws provide for a Board of Directors that is divided into three classes. The term of the Class I Directors expires at the 2021 Annual Meeting, the term of the Class II Directors expires at the 2019 Annual Meeting and the term of the Class III Directors expires at the 2020 Annual Meeting. Our Board of Directors, upon the recommendation of our Nominating and Corporate Governance Committee, has nominated Jacqueline F. Moloney and Michelle M. Warner to serve as Class II Directors for a term to expire at the 2022 Annual Meeting. Ms. Moloney currently serves as a director. Each nominee has consented to being named herein and, if elected, to serve as a director until her successor is duly elected and qualified.

Shares represented by all proxies received by the Board of Directors and not so marked as to withhold authority to vote for an individual director will be voted (unless one or more nominees are unable or unwilling to serve) for the election of the nominees named below. The Board of Directors expects that each of the nominees named below will be available for election, but if either of them is not a candidate at the time the election occurs, it is intended that such proxies will be voted for the election of a substitute nominee to be designated by the Board of Directors.

THE BOARD OF DIRECTORS BELIEVES THAT APPROVAL OF THE ELECTION OF JACQUELINE F. MOLONEY AND MICHELLE M. WARNER TO SERVE AS CLASS II DIRECTORS IS IN THE BEST INTERESTS OF MKS AND OUR SHAREHOLDERS AND THEREFORE RECOMMENDS A VOTE FOR BOTH NOMINEES.

DIRECTORS

Set forth below are the names and ages of each member of our Board of Directors (including those who are nominees for election as Class II Directors) and Ms. Warner, the positions and offices held, principal occupation and business experience during at least the past five years, the names of other publicly held companies on which the individual currently serves, or in the past five years has served, as a director and the year each member of our Board of Directors joined our Board. We have also included information about each individual's specific experience, qualifications, attributes, or skills that led the Board of Directors to conclude that he or she should serve as a director of MKS. Information with respect to the number of shares of Common Stock beneficially owned by each individual, directly or indirectly, as of January 1, 2019, appears in this proxy statement under the heading Security Ownership of Certain Beneficial Owners and Management. Richard S. Chute and Peter R. Hanley, who currently serve as Class II Directors, are not standing for re-election to the Board of Directors and, accordingly, their tenure as directors will end as of the date of our 2019 Annual Meeting on May 8, 2019.

Name	Age	Position	Class to Which Director Currently Belongs
John R. Bertucci	78	Director, Chairman	III
Rajeev Batra(3)	51	Director	I
Gregory R. Beecher(1)	61	Director	III
Richard S. Chute(2)	80	Director, Secretary	II
Gerald G. Colella	62	Director, Chief Executive Officer	I
Peter R. Hanley(2)(3)	79	Director	II
Rick D. Hess(3)	65	Director	III
Jacqueline F. Moloney(1)(2)*	65	Director	II

Elizabeth A. Mora(1)(3)	58	Director	I
Michelle M. Warner*	52	Director Nominee	N/A

(1) Member of Audit Committee

(2) Member of Nominating and Corporate Governance Committee

(3) Member of Compensation Committee

* Nominee for election at this meeting

Table of Contents

Name	Year Became Director	Background and Qualifications
John R. Bertucci	1970	Mr. Bertucci has been Chairman of the Board of Directors since November 1995. Mr. Bertucci served as Executive Chairman from July 2005 until December 2006. Mr. Bertucci served as our Chief Executive Officer from November 1995 to July 2005 and served as President from 1974 to May 1999 and again from November 2001 to April 2004. From 1970 to 1974, he was our Vice President and General Manager. Mr. Bertucci holds an M.S. in Industrial Administration and a B.S. in Metallurgical Engineering from Carnegie Mellon University. Mr. Bertucci has served as a member of the Board of Trustees of Carnegie Mellon University since May 2002 and served on its Audit Committee and Executive Committee from 2007 to 2016. He also serves as a member of the Board of Trustees or the Board of Directors of three non-profit organizations. Mr. Bertucci's 35 years of experience working for MKS, including a combined 28 years as our President, gives him a unique insight into the challenges and strategies relevant to the semiconductor industry as a whole, and to our Company in particular.
Rajeev Batra	2018	Mr. Batra has served since October 2014 as President of the Digital Factory Division of Siemens Industry, Inc., a subsidiary of Siemens Corporation in the United States. Siemens USA and Siemens entities worldwide focus on the areas of electrification, automation, and digitalization. From 1993 to 2014, Mr. Batra served in various senior roles at Siemens Industry, Inc., including President of the Industrial Automation Division from October 2009 to October 2014, Vice President and General Manager, Automation & Motion from October 2007 to October 2009, and Vice President and General Manager, Automation & Aerospace Vertical Division from October 2002 to October 2007. Mr. Batra received a B.S. in Electrical Engineering and Electronic Engineering from Lawrence Technological University and an M.B.A. from the University of Michigan. Mr. Batra's 15-plus years in executive leadership roles in the automotive, aerospace and industrial industries, including his current role as President of the Digital Factory Division of Siemens Industry, Inc., qualify him to serve as a member of our Board of Directors.
Gregory R. Beecher	2006	Mr. Beecher has served as Chief Financial Officer of Teradyne, Inc., a semiconductor and system level test equipment provider, since 2001. Mr. Beecher was an audit partner with PricewaterhouseCoopers LLP from October 1993 to March 2001, working with numerous semiconductor equipment and instrument providers, along with other technology-related enterprises, and advising on complex accounting issues. Mr. Beecher has an M.S. in Accounting from Northeastern University. Mr. Beecher served as a director and Chairman of the Audit Committee of Xyleco, Inc., a privately held company, from October 2016 to March 2019 and as a director of Hittite Microwave Corporation, a publicly traded developer of high performance integrated circuits, modules and subsystems, from June 2013 to May 2014. Mr. Beecher's extensive financial background,

including his previous experience at a public accounting firm and his current role as Chief Financial Officer of a publicly held company, provides valuable insights for our Board of Directors and the Audit Committee.

Table of Contents

Name	Year Became Director	Background and Qualifications
Gerald G. Colella	2014	<p>Mr. Colella has served as our Chief Executive Officer since January 2014. Additionally, he served as our President from February 2013 to May 2018. He served as our Chief Operating Officer from January 2010 until December 2013 (additionally serving as Vice President until his promotion to President in February 2013). He served as our Vice President and Chief Business Officer from April 2005 until January 2010. In addition, Mr. Colella also served as our Acting Group Vice President, PRG Products, from July 2007 to March 2010. From October 1997 to April 2005, he served as our Vice President, Global Business and Service Operations; from March 1996 to October 1997, he served as our Director of Materials Planning and Logistics; and from 1994 to 1996, he served as our Materials Planning and Logistics Manager. Mr. Colella joined MKS in 1983. He holds a B.A. in Secondary Education from the University of Massachusetts and an M.B.A. from Southern New Hampshire University. Mr. Colella's 35 years of experience within the Company gives him particularly deep insight into our organization.</p>
Rick D. Hess	2017	<p>Mr. Hess served as Strategic Advisor to the Chief Executive Officer of Analog Devices, Inc., a publicly held semiconductor company specializing in data conversion and signal processing technology, from June 2017 until August 2018. From 2014 to 2017, Mr. Hess served in various senior roles at Analog Devices, including Executive Vice President from September 2016 to June 2017; Senior Vice President, Communications and Automotive Business Group from November 2014 to September 2016; and Vice President, Radio and Microwave Group from July 2014 to November 2014. Before joining Analog Devices, Mr. Hess served as the Chief Executive Officer of Hittite Microwave Corporation from February 2013 to July 2014 (when it was acquired by Analog Devices). From 2011 to 2013, he was Vice President at American Superconductor Corporation, a provider of technologies and solutions for the electrical power infrastructure industry. From 2006 to 2010, Mr. Hess was President and Chief Executive Officer of Konarka Technologies, Inc., a developer of advanced photovoltaic cells on flexible plastic. From 2004 to 2006, he was President and Chief Executive Officer of Integrated Fuel Cell Technologies, Inc., a developer of fuel cell systems. From 1989 to 2004, Mr. Hess held several positions at M/A-COM, a semiconductor provider of high frequency components and systems for the wireless, defense, public safety and automotive markets, including President from 1999 to 2004. Mr. Hess had previously founded Stable Energy Sources, a manufacturer of microwave subsystems and components serving military and industrial markets. Mr. Hess served as a member of the Board of Directors of Hittite Microwave Corporation from 2005 until 2014. Mr. Hess received a B.S. in Electrical Engineering from Purdue University and an M.S. in Electrical Engineering from Johns Hopkins University. Mr. Hess' 30-plus years in executive leadership roles in the</p>

microwave, semiconductor, energy and manufacturing industries qualify him to serve as a member of our Board of Directors.

Table of Contents

Name	Year Became Director	Background and Qualifications
Jacqueline F. Moloney	2016	Ms. Moloney has served since 2015 as the Chancellor of the University of Massachusetts Lowell, a public university with over 17,000 students, and served as its Executive Vice Chancellor from 2007 to 2015. Ms. Moloney has been a tenured professor at the University since 1994 and served as the Dean of Online and Continuing Education from 1994 to 2007. Since 2008, Ms. Moloney has served as a director and member of the audit, strategic planning, marketing, investment, technology and executive committees of Enterprise Bancorp, Inc., a publicly held bank. She holds an Ed.D. from the University of Massachusetts Lowell. Ms. Moloney has over 30 years of experience as a leader in non-profit organizations. She has a deep history of working with business and industry, and she established the first incubators at the University of Massachusetts Lowell which are the home to approximately 50 early stage companies. She provides valuable knowledge and insight on emerging strategic planning and management and business trends.
Elizabeth A. Mora	2012	Ms. Mora has served since March 2016 as the Chief Administrative Officer, and from 2008 to February 2016 served as the Chief Financial Officer, of The Charles Stark Draper Laboratory, Inc., a non-profit engineering research and development laboratory serving the national interest in applied research, engineering development, advanced technical education, and technology transfer. From 1997 until 2008, she worked for Harvard University, ultimately serving as Chief Financial Officer and Vice President for Finance, and previously serving as Associate Vice President, Research Administration and the Director of the Office of Sponsored Research. Prior to joining Harvard, Ms. Mora worked for Coopers and Lybrand (now PricewaterhouseCoopers LLP) from 1989 to 1997 and was one of the founding members of its National Regulatory Consulting Practice. Ms. Mora is a Certified Public Accountant and has an M.B.A. from the Simmons College Graduate School of Management. She has served since 2016 as a director, and since January 2017 as Chairman of the Corporate Responsibility Committee, of GCP Applied Technologies, Inc., a publicly held company that provides construction and packaging technology products. Ms. Mora's extensive financial background, including her current role as Chief Administrative Officer of a prominent research and development organization, provides valuable insights for our Board of Directors, the Audit Committee and the Compensation Committee, and strong leadership as Chair of the Compensation Committee.

Table of Contents

Name	Year Became Director	Background and Qualifications
Michelle M. Warner	Director Nominee	Ms. Warner has served as Senior Vice President, General Counsel and Corporate Secretary for USG Corporation, a leading manufacturer of building products and solutions, since January 2016, and will serve until the completion of the announced acquisition of USG by Gebr. Knauf KG. From 1997 until 2016, she worked in a variety of legal positions for Motorola Solutions, Inc. (formerly Motorola, Inc.), most recently as Deputy General Counsel and Corporate Secretary, prior to that, serving as Corporate Vice President, Law, Corporate, Securities and Transactions. She serves on the Board of Directors for Logan Square Preservation, a non-profit organization, and is Chair of the President's Council and an ex officio member of the Board of Trustees of the Museum of Science and Industry, Chicago. She also serves on the Board of Advisors of Denison University. Ms. Warner received a J.D. from the Northwestern University School of Law and a B.S. in Economics from Denison University. Due to Ms. Warner's strong background in mergers and acquisitions, as well as securities and corporate governance, she provides valuable experience to our Board.

Agreements as to Nomination

Mr. Bertucci resigned from his employment with MKS effective December 31, 2006. Mr. Bertucci's employment agreement provided that if Mr. Bertucci resigned from his employment, then, subject to applicable law, our Amended and Restated By-Laws, our Restated Articles of Organization and the directors' fiduciary duties, the Board of Directors shall nominate Mr. Bertucci for election as a Class III Director and consider Mr. Bertucci for appointment as Chairman of the Board of Directors, until such time as Mr. Bertucci is no longer eligible for nomination as a director.

Table of Contents

PROPOSAL TWO ADVISORY VOTE ON EXECUTIVE COMPENSATION

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, or the Dodd-Frank Act, which added Section 14A to the Exchange Act, enables our shareholders to vote to approve, on a non-binding, advisory basis, the compensation of our Named Executive Officers as disclosed in this proxy statement under the heading Executive Compensation including Compensation Discussion and Analysis, the tabular disclosure regarding such compensation, and the accompanying narrative disclosure. This vote is not intended to address any specific item of compensation, but rather the overall compensation of our Named Executive Officers and the philosophy, policies and practices of executive compensation described in this proxy statement. The advisory vote is not a vote on our compensation practices for non-executive employees or our Board of Directors. The Dodd-Frank Act requires the Company to hold the advisory vote on executive compensation at least once every three years, but we have elected to submit the advisory vote to shareholders annually.

As described in detail under the heading Executive Compensation Compensation Discussion and Analysis, our executive compensation programs are designed to attract, motivate, and retain our Named Executive Officers, who are critical to our success. Under these programs, our Named Executive Officers are rewarded for the achievement of specific short-term and long-term goals. Please see the Compensation Discussion and Analysis for additional details about our executive compensation philosophy and programs, including information about the compensation of our Named Executive Officers for the 2018 fiscal year.

The Compensation Committee continually reviews the compensation programs for our Named Executive Officers to ensure they achieve the desired goals of aligning our executive compensation structure with our shareholders interests and current market practices.

Our Board of Directors is asking shareholders to approve a non-binding advisory vote on the following resolution:

RESOLVED, that the compensation paid to the Company s Named Executive Officers, as disclosed pursuant to the compensation disclosure rules of the SEC, including the Compensation Discussion and Analysis, the compensation tables and any related material disclosed in this proxy statement, is hereby approved.

This vote on the compensation of our Named Executive Officers is advisory, and therefore not binding on the Company, the Compensation Committee or our Board of Directors. Our Board of Directors and our Compensation Committee value the opinions of our shareholders and to the extent there is any significant vote against the Named Executive Officers compensation as disclosed in this proxy statement, we will consider our shareholders concerns and the Compensation Committee will evaluate whether any actions are necessary to address those concerns.

THE BOARD OF DIRECTORS BELIEVES THAT THE PROPOSAL TO APPROVE, ON A NON-BINDING ADVISORY BASIS, THE EXECUTIVE COMPENSATION CONTAINED IN THIS PROXY STATEMENT IS IN THE BEST INTERESTS OF MKS AND OUR SHAREHOLDERS AND THEREFORE RECOMMENDS A VOTE FOR THIS PROPOSAL.

Table of Contents

**PROPOSAL THREE RATIFICATION OF SELECTION OF INDEPENDENT REGISTERED PUBLIC
ACCOUNTING FIRM**

Our Audit Committee has selected PricewaterhouseCoopers LLP, or PwC, as the Company's independent registered public accounting firm for the fiscal year ending December 31, 2019. PwC was our independent registered public accounting firm for the fiscal year ended December 31, 2018.

Representatives of PwC are expected to be present at the Annual Meeting and will have the opportunity to make a statement if they so desire and will be available to respond to appropriate questions from shareholders. In the event that the ratification of the selection of PwC as our independent registered public accounting firm is not obtained at the Annual Meeting, the Board of Directors will reconsider its appointment.

THE BOARD OF DIRECTORS BELIEVES THAT THE PROPOSAL TO RATIFY THE SELECTION OF PWC AS OUR INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM FOR THE FISCAL YEAR ENDING DECEMBER 31, 2019 IS IN THE BEST INTERESTS OF MKS AND OUR SHAREHOLDERS AND THEREFORE RECOMMENDS A VOTE FOR THIS PROPOSAL.

CORPORATE GOVERNANCE

Board Independence

The Board of Directors has determined that all of the members of the Board of Directors, other than Mr. Colella, are independent as defined under the rules of the Nasdaq Stock Market, or Nasdaq.

Board Leadership Structure

Since 2005, we have separated the roles of Chief Executive Officer and Chairman of the Board of Directors in recognition of the differences between the two roles. The Chief Executive Officer is responsible for setting the strategic direction of the Company and the day-to-day leadership and performance of the Company, while the Chairman of the Board of Directors provides guidance to the Chief Executive Officer, sets the agenda for Board meetings and presides over meetings of the full Board of Directors.

In addition, the Board of Directors has established the position of Lead Director. Our Corporate Governance Guidelines provide that during any period in which the Chairman of the Board of Directors is not an independent director, and in such other instances as the Board of Directors may determine from time to time, a Lead Director shall be elected by and from the independent directors. While we are not obligated under our Corporate Governance Guidelines to have a Lead Director, as our Chairman of the Board of Directors is independent, we have currently elected to continue to do so. Mr. Beecher has served as Lead Director since 2012.

The primary role of the Lead Director is to serve as a liaison between the independent directors and the Chairman of the Board of Directors and/or the Chief Executive Officer and to represent the interests of the independent directors, as appropriate. Pursuant to our Corporate Governance Guidelines, which are posted on our website at investor.mksinst.com in the Corporate Governance tab, the Lead Director shall, among other matters:

have the authority to call meetings of the independent directors;

preside at all meetings of the Board of Directors at which the Chairman of the Board of Directors is not present;

assure that at least two meetings per year of only the independent directors are held and chair any such meetings of the independent directors;

facilitate communications and serve as a liaison between the independent directors and the Chairman of the Board of Directors and/or the Chief Executive Officer, provided that any director is free to communicate directly with the Chairman of the Board of Directors and with the Chief Executive Officer;

work with the Chairman of the Board of Directors and the Chief Executive Officer in the preparation of the agenda for each Board of Directors meeting and approve each such agenda;

Table of Contents

if a meeting is held between a major shareholder and a representative of the independent directors, the Lead Director shall serve, subject to availability, as such representative of the independent directors; and

otherwise consult with the Chairman of the Board of Directors and the Chief Executive Officer on matters relating to corporate governance and performance of the Board of Directors.

Our Board of Directors believes that its leadership structure is appropriate at this time for our Company because it strikes an effective balance between management and independent leadership participation in the Board of Directors process.

Communications from Shareholders

The Board of Directors will give attention to written communications that are submitted by shareholders and will respond if appropriate. The Chair of the Nominating and Corporate Governance Committee, with the assistance of our General Counsel, is primarily responsible for monitoring communications from shareholders and for providing copies or summaries to the other directors as he or she considers appropriate. Communications are forwarded to all directors if they relate to important substantive matters and include suggestions or comments that the Chair of the Nominating and Corporate Governance Committee considers to be important for the directors to know. In general, communications relating to corporate governance and long-term corporate strategy are more likely to be forwarded than communications relating to ordinary business affairs, personal grievances and matters as to which we tend to receive repetitive or duplicative communications.

Shareholders who wish to send communications on any topic to the Board of Directors should address such communications to the Board of Directors in care of Kathleen F. Burke, Esq., Senior Vice President and General Counsel, MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, MA 01810.

Code of Ethics

We have adopted a code of business conduct and ethics that applies to all of our directors, officers and employees (including the principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions), which is posted on our website at investor.mksinst.com in the Corporate Governance tab. We intend to disclose on our website any amendments to, or waivers for our executive officers or directors from, our code of business conduct and ethics.

Board's Role in Risk Oversight

Management is responsible for the day-to-day management of risks the Company faces, while the Board of Directors, as a whole and through its committees, has the ultimate responsibility for the oversight of risk management. Senior management attends quarterly meetings of the Board of Directors, provides presentations on operations including significant risks, and is available to address any questions or concerns raised by the Board of Directors. Additionally, our three standing board committees assist the Board of Directors in fulfilling its oversight responsibilities in certain areas of risk. Pursuant to its charter, the Audit Committee coordinates the Board of Directors' oversight of the Company's internal controls over financial reporting, disclosure controls and procedures, and code of conduct. The Audit Committee also is responsible for discussing the Company's policies with respect to financial risk assessment and financial risk management. Management regularly reports to the Audit Committee on these areas. The Compensation Committee assists the Board of Directors in fulfilling its oversight responsibilities with respect to the management of risks arising from our compensation policies and programs as well as succession planning as it relates to our Chief Executive Officer. The Nominating and Corporate Governance Committee assists the Board of Directors

in fulfilling its oversight responsibilities with respect to the management of risks associated with board organization, membership and structure, succession planning for our directors and corporate governance. In addition, from time to time, the Board of Directors may constitute a special committee to focus on a particular matter or risk. When any of the committees receives a report related to material risk oversight, the chair of the relevant committee reports on the discussion to the full Board of Directors.

Table of Contents

Transactions with Related Persons

Our code of business conduct and ethics sets forth the general principle that our directors, officers and employees should refrain from engaging in any activity having a personal interest that presents a conflict of interest. The code of business conduct and ethics prohibits certain specified activities, and also prohibits directors, officers and employees from engaging in any other activity that may reasonably be expected to give rise to a conflict of interest or to adversely affect our interests. The code of business conduct and ethics provides that all employees are responsible to disclose to the Chief Financial Officer any material transaction or relationship that reasonably could be expected to give rise to a material conflict of interest, and officers and directors must report such transactions to the Board of Directors, which shall be responsible for determining whether such transaction or relationship constitutes a material conflict of interest.

In addition, our written Related Person Transaction Procedures set forth the procedures for reviewing transactions that could be deemed to be related person transactions (defined as transactions required to be disclosed pursuant to Item 404 of Regulation S-K of applicable SEC regulations). In accordance with these procedures, directors and executive officers are required to submit annual certifications regarding interests and affiliations held by them and certain of their family members. We then review our records to determine whether we have engaged in any transactions since the beginning of our prior fiscal year with such affiliated persons and entities or with any person or entity known by MKS to be the beneficial owner of more than 5% of our voting securities, and provide a summary to the Audit Committee of any such material transaction in which the related person has a direct or indirect interest. In accordance with the procedures, the Audit Committee reviews any such transactions (including, but not limited to, transactions constituting related person transactions). In reviewing any such transaction, the Audit Committee considers, among other things, the related person's interest in the transaction, the approximate dollar value of the transaction, whether the transaction was undertaken in the ordinary course of business, whether the terms of the transaction were at arm's length, the purpose and potential benefits to the Company of the transaction, and whether the transaction is in the best interests of the Company. The Audit Committee may, in its sole discretion, impose such conditions as it deems appropriate in connection with any related person transaction. In accordance with the Audit Committee charter, the Audit Committee reviews the Related Person Transaction Procedures from time to time.

Wellington Management Group LLP, Wellington Group Holdings LLP, Wellington Investment Advisors Holdings LLP, and Wellington Management Company LLP, which we refer to collectively as the Wellington Group, collectively beneficially owned approximately 5% of the Company's outstanding voting shares during a portion of the year 2018, but their holdings fell below that threshold as of December 31, 2018, according to filings they have made with the SEC. Wellington Management LLC, an affiliate of the Wellington Group, manages cash accounts of MKS, in the aggregate amount of approximately \$260 million as of December 31, 2018. In 2018, MKS paid Wellington Management LLC approximately \$125,000 for these cash management services. Wellington Management LLC must manage the MKS cash accounts in accordance with, and subject to, the Company's Corporate Investment Policy, which establishes clear guidelines for acceptable investments. As part of our Related Person Transaction Procedures, our Audit Committee reviewed the foregoing relationship with Wellington Management LLC.

Board of Director Meetings and Committees of the Board of Directors

The Board of Directors held six meetings in 2018. During 2018, each director attended at least 75% of the aggregate of the total number of meetings of the Board of Directors and the total number of meetings of all committees of the Board of Directors on which he or she served. Pursuant to our Corporate Governance Guidelines, directors are encouraged to attend our Annual Meeting of Shareholders. All of the directors then serving on the Board of Directors attended the 2018 Annual Meeting of Shareholders.

The Board of Directors has established three standing committees – Audit, Compensation, and Nominating and Corporate Governance – each of which operates under a charter that has been approved by the Board of Directors. Each committee’s current charter is posted on our website at investor.mksinst.com in the Corporate Governance tab.

Table of Contents

Audit Committee

The Audit Committee consists of Mr. Beecher (Chair), Ms. Moloney and Ms. Mora. The Board of Directors has determined that each of the three current members of the Audit Committee is an audit committee financial expert as defined in applicable SEC regulations. Each member of the Audit Committee also meets the requirements for independence under applicable Nasdaq and SEC rules. The Audit Committee's responsibilities include:

appointing, approving the fees of, assessing the independence of, evaluating, retaining and, when necessary, terminating the engagement of our independent registered public accounting firm;

overseeing the work of our independent registered public accounting firm, including through the receipt and consideration of certain reports from the independent registered public accounting firm;

reviewing and discussing our annual audited financial statements and related disclosures with management and the independent registered public accounting firm;

reviewing our quarterly unaudited financial statements;

coordinating oversight of our internal controls over financial reporting, disclosure controls and procedures, and code of business conduct and ethics;

overseeing our internal audit function;

discussing our policies with respect to financial risk assessment and financial risk management;

establishing procedures for the receipt and retention of accounting-related complaints and concerns;

discussing generally the types of information to be disclosed in our earnings press releases, as well as in financial information and earnings guidance provided to analysts, rating agencies and others;

meeting independently with our internal audit staff, independent registered public accounting firm and management;

reviewing our procedures for reviewing related person transactions, recommending any changes to these procedures and reviewing any related person transactions;

reviewing and approving swaps, including those subject to mandatory clearing; and

preparing the Audit Committee report required to be included in the annual proxy statement. The Audit Committee held five meetings in 2018.

Compensation Committee

The Compensation Committee consists of Ms. Mora (Chair), Mr. Batra, Dr. Hanley and Mr. Hess. Each member of the Compensation Committee meets the requirements for independence under applicable Nasdaq and SEC rules. The Compensation Committee's responsibilities include:

reviewing and approving the compensation of our Chief Executive Officer and our other executive officers;

overseeing the evaluation of our executive officers;

overseeing Chief Executive Officer and other executive officer succession planning;

periodically reviewing and approving our management incentive bonus plan;

overseeing the risks associated with our compensation policies and practices and annually reviewing whether such policies and practices are reasonably likely to have a material adverse effect on the Company;

reviewing the Compensation Discussion and Analysis required to be included in the annual proxy statement;

Table of Contents

preparing the annual Compensation Committee Report required to be included in the annual proxy statement;

overseeing and administering our equity incentive plans;

reviewing and making recommendations to the Board of Directors with respect to director compensation; and

appointing, compensating, assessing the independence of, and overseeing the work of any compensation consultant.

The Compensation Committee held ten meetings in 2018. See the section below entitled *Executive Compensation Discussion and Analysis* for further information about the role of the Compensation Committee and the scope of its activities.

Compensation Risk Assessment

Our Compensation Committee engaged its independent compensation consultant, Meridian, to conduct a risk assessment of our compensation programs and practices to understand if any risks exist that are reasonably likely to have a material adverse effect on our Company, and the results were reviewed by our Compensation Committee. Based on this assessment, our Compensation Committee concluded that our compensation programs and practices, as a whole, are appropriately structured and do not pose a material risk to our Company. Our compensation programs are intended to reward our executive officers and other employees for strong performance over the long-term, with consideration to short-term actions and results that strengthen and grow our Company. We believe our compensation programs provide the appropriate balance between short-term and long-term incentives, focusing on sustainable and profitable growth for our Company.

Compensation Committee Interlocks and Insider Participation

In 2018, the Compensation Committee was comprised of Ms. Mora (Chair), Dr. Hanley and Mr. Hess, with Mr. Batra joining in October 2018. None of the members of the Compensation Committee during 2018 were, at any time, officers or employees of MKS or our subsidiaries, and none of them had any relationship with us requiring disclosure under Item 404 of Regulation S-K under the Securities Exchange Act of 1934, as amended. None of our executive officers serves, or has served, as a member of the Board of Directors or Compensation Committee (or other committee serving an equivalent function) of any other entity which has one or more executive officers serving as a member of our Board of Directors or Compensation Committee.

Nominating and Corporate Governance Committee

The Nominating and Corporate Governance Committee consists of Mr. Chute (Chair), Dr. Hanley and Ms. Moloney. Each member of the Nominating and Corporate Governance Committee meets the requirements for independence under applicable Nasdaq and SEC rules. The Nominating and Corporate Governance Committee's responsibilities include:

identifying individuals qualified to become members of the Board of Directors, consistent with criteria approved by the Board of Directors;

recommending to the Board of Directors the persons to be nominated for election as directors and to each of the committees of the Board of Directors;

designating a Lead Director (if any), subject to the approval of the independent directors;

reviewing each director's continuation on the Board of Directors at least once every three years;

developing and recommending corporate governance guidelines to the Board of Directors;

retaining and terminating any search firm to be used to identify director nominees;

periodically reviewing the Board of Directors' leadership structure to assess whether it is appropriate;

Table of Contents

conducting the annual evaluations of the Board of Directors, each of the committees of the Board of Directors and the directors who are up for nomination; and

monitoring communications from shareholders and other interested parties.

The Nominating and Corporate Governance Committee held three meetings in 2018.

For information relating to the nomination of directors, see [Director Candidates](#) below.

Director Candidates

The Nominating and Corporate Governance Committee recommended to the Board of Directors that the director nominees be nominated by the Board of Directors for election as Class II Directors. The Nominating and Corporate Governance Committee utilizes a number of processes to identify and evaluate director candidates, including the engagement of a third party executive search firm to identify potential new directors, Board assessments of each incumbent director nominee for the current year, requests to Board members and others for recommendations of potential candidates, meetings from time to time to evaluate biographical information and background material relating to potential candidates and interviews of selected candidates by the members of the Nominating and Corporate Governance Committee and the Board of Directors. Mr. Batra, who was appointed to fill a vacancy on the Board in 2018, and Ms. Warner, a nominee for director, were each identified to the Company by an executive search firm. The Nominating and Corporate Governance Committee provided the desired criteria and characteristics to the search firm, including the type of experience that was sought. Certain Board members conducted an initial screening of candidates, and then final candidates were interviewed by a special committee of the Board of Directors, which included two members of the Nominating and Corporate Governance Committee. Upon the recommendation of the special committee, the Nominating and Corporate Governance Committee recommended to the Board of Directors Mr. Batra and Ms. Warner, in 2018 and 2019, respectively.

In considering whether to recommend any particular candidate for inclusion in the Board of Directors' slate of recommended director nominees, the Nominating and Corporate Governance Committee applies the criteria attached to the Company's Corporate Governance Guidelines. These criteria include the candidate's integrity, business acumen, knowledge of our business and industry, age, tenure, experience, diligence, conflicts of interest and the ability to act in the interests of all shareholders. The Nominating and Corporate Governance Committee does not assign specific weights to particular criteria and no particular criterion is a prerequisite for each prospective nominee. Nominees shall not be discriminated against on the basis of race, religion, national origin, sex, sexual orientation, disability or any other basis proscribed by law. In considering director candidates, the Nominating and Corporate Governance Committee takes into account the value of diversity on the Board of Directors. While the Nominating and Corporate Governance Committee does not have a formal policy with respect to diversity, the Board of Directors and the Nominating and Corporate Governance Committee believe that it is essential that the members of the Board of Directors represent diverse viewpoints. In considering candidates for the Board of Directors, the Nominating and Corporate Governance Committee considers the entirety of each candidate's credentials in the context of these standards. We believe that the backgrounds and qualifications of our directors, considered as a group, should provide a composite mix of experience, knowledge and abilities that will allow the Board of Directors to fulfill its responsibilities.

Shareholders may recommend individuals to the Nominating and Corporate Governance Committee for consideration as potential director candidates by submitting their names, together with appropriate biographical information and background materials and a statement as to whether the shareholder or group of shareholders making the recommendation has beneficially owned at least \$2,000 in market value or 1% of our Common Stock, whichever is

less, for at least a year as of the date such recommendation is made, to the Nominating and Corporate Governance Committee, in care of Kathleen F. Burke, Esq., Senior Vice President and General Counsel, MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, MA 01810. Assuming that appropriate biographical and background material has been provided on a timely basis, the Nominating and Corporate Governance Committee will evaluate shareholder-recommended candidates by following substantially the same process, and applying the same criteria, as it does in considering other candidates.

Table of Contents

Shareholders also have the right under our Amended and Restated By-Laws to directly nominate director candidates, without any action or recommendation on the part of the Nominating and Corporate Governance Committee or the Board of Directors, by following the procedures set forth under the heading **Deadline for Submission of Shareholder Proposals for the 2020 Annual Meeting** below.

DIRECTOR COMPENSATION**Cash Compensation**

The following table summarizes our current cash compensation payable by us to non-employee directors:

	Annual Retainer
Base Retainer for All Non-Employee Board Members	\$ 70,000
<i>Additional Retainers for Services:</i>	
Chairman	\$ 60,000
Lead Director	\$ 20,000
Audit Committee Chair	\$ 25,000
Other Audit Committee Members	\$ 12,500
Compensation Committee Chair	\$ 20,000
Other Compensation Committee Members	\$ 8,000
Nominating and Corporate Governance Committee Chair	\$ 12,500
Other Nominating and Corporate Governance Committee Members	\$ 5,500

In October 2017, the Board of Directors, upon the recommendation of the Compensation Committee, increased, effective April 1, 2018, the base retainer from \$60,000 to \$70,000 and the Chairman retainer from \$45,000 to \$60,000.

In addition, from time to time, the Board of Directors may establish special committees related to specific matters and may include a retainer for service on such special committees in its discretion.

Equity Compensation

Non-employee directors are eligible for awards under our 2014 Stock Incentive Plan, which is administered by the Compensation Committee. In 2018, under our director compensation program, non-employee directors received automatic grants of restricted stock units, or RSUs, on the date of the 2018 Annual Meeting of Shareholders, with a grant date value of \$170,000, which RSUs shall vest in full on the day prior to the first annual meeting of shareholders following the date of grant (or if no such meeting is held within 13 months after the date of grant, on the 13 month anniversary of the date of grant).

If a new non-employee director joins our Board of Directors after our annual meeting of shareholders but before January 1st of the following year, he or she will be entitled to an initial RSU grant with a value equal to the annual RSU grant. In the event a non-employee director joins our Board of Directors during the period from January 1st through the date of that year's annual meeting of shareholders, he or she will not be entitled to an initial RSU grant but will be entitled to the annual RSU grant on the date of the annual meeting of shareholders.

Mr. Bertucci

Mr. Bertucci resigned from his employment as our Executive Chairman effective December 31, 2006. At that time, he remained a Class III Director and became non-executive Chairman of the Board of Directors. Pursuant to the terms of his employment agreement, Mr. Bertucci receives retiree medical benefits for life for himself and his spouse, which had a net present value of \$276,201 as of December 31, 2018. The agreement requires that he make an annual contribution towards the retiree benefits of \$1,500. Mr. Bertucci also receives a car allowance for life, which had a net present value of \$174,018 as of December 31, 2018. Mr. Bertucci receives no other retirement benefits.

Table of Contents

The following table summarizes compensation paid to non-employee directors in 2018. Mr. Colella is excluded from the table because he is an executive officer, and his compensation is set forth in the Executive Compensation section below, under the heading Executive Compensation Tables Summary Compensation Table for 2018.

Director Compensation Table for 2018

Name	Fees Earned or Paid in			Total (\$)
	Cash (\$)	Stock Awards (\$)(1)	All Other Compensation (\$)	
Rajeev Batra(2)	\$ 19,500	\$ 170,000	\$ -	\$ 189,500
Gregory R. Beecher	\$ 122,250(3)	\$ 170,000	\$ -	\$ 292,250
John R. Bertucci	\$ 129,750(3)	\$ 170,000	\$ 41,353(4)	\$ 341,103
Richard S. Chute	\$ 80,000	\$ 170,000	\$ -	\$ 250,000
Peter R. Hanley	\$ 81,000	\$ 170,000	\$ -	\$ 251,000
Rick D. Hess	\$ 75,500	\$ 170,000	\$ -	\$ 245,500
Jacqueline F. Moloney	\$ 85,500	\$ 170,000	\$ -	\$ 255,500
Elizabeth A. Mora	\$ 100,000	\$ 170,000	\$ -	\$ 270,000
Robert J. Phillippy(5)	\$ 22,500	\$ -	\$ 12,698(5)	\$ 35,198

- (1) Represents the aggregate grant date fair value for each RSU granted during the year, calculated in accordance with Financial Accounting Standards Board Accounting Standards Codification 718, or ASC 718. The assumptions used in determining the grant date fair values of these awards are set forth in Note 16 to our consolidated financial statements, which were included in our 2018 Annual Report filed with the SEC on February 26, 2019. Except for Mr. Batra, the outstanding stock awards held as of December 31, 2018 by each of the other non-employee directors consisted of 1,499 RSUs. The outstanding stock awards held by Mr. Batra as of December 31, 2018 consisted of 2,114 RSUs.
- (2) Mr. Batra became a director on October 1, 2018 and was elected to the Compensation Committee on October 29, 2018.
- (3) Includes \$6,000 in consideration for services on a special committee of the Board of Directors, which compensation consisted of a flat fee of \$3,000 for up to five meetings and \$1,000 per meeting thereafter up to a maximum of \$10,000.
- (4) In connection with his retirement and pursuant to the terms of his previous employment agreement, Mr. Bertucci receives retiree medical benefits and a car allowance. The retiree medical benefits consist of benefits for life for himself and his spouse, towards which Mr. Bertucci makes an annual contribution of \$1,500. We paid \$16,523

for this benefit in 2018. We paid \$24,830 for Mr. Bertucci's car allowance in 2018.

- (5) Mr. Phillippy served as a director until May 2018. He was an employee of ours from April 2016, when we acquired Newport Corporation, until July 1, 2016. Pursuant to the terms of his amended and restated severance compensation agreement, Mr. Phillippy received benefits continuation for a period of twenty-four months from his termination date from the Company as an employee. These benefits consisted of medical, dental and vision benefits for himself and his family and long-term disability insurance for himself. We paid \$12,698 for these benefits in 2018.

SECTION 16(a) BENEFICIAL OWNERSHIP REPORTING COMPLIANCE

Section 16(a) of the Securities Exchange Act of 1934, as amended, requires executive officers, directors and shareholders who beneficially own more than 10% of our Common Stock to file initial reports of ownership on Form 3 and reports of changes in ownership on Form 4 with the SEC and any national securities exchange on which our securities are registered. Executive officers, directors and greater than 10% beneficial owners are required by the SEC's regulations to furnish us with copies of all Section 16(a) forms they file.

Table of Contents

Based solely on a review of the copies of such forms, and amendments thereto, furnished to us and written representations from the executive officers and directors, pursuant to Item 405 of Regulation S-K, we believe that all of our executive officers, directors and greater than 10% shareholders have complied with all applicable Section 16(a) filing requirements.

AUDIT AND FINANCIAL ACCOUNTING OVERSIGHT**Audit Committee Report**

The Audit Committee of our Board of Directors has reviewed our audited financial statements for the year ended December 31, 2018 and discussed them with our management.

The Audit Committee has also received from, and discussed with, PricewaterhouseCoopers LLP, or PwC, our independent registered public accounting firm, various communications that our registered public accounting firm is required to provide to the Audit Committee, including the matters required to be discussed by the Auditing Standard No. 1301, *Communications with Audit Committees*.

The Audit Committee has received the written disclosures and the letter from our independent registered public accounting firm required by Independence Standards Board Standard No. 1 (Independence Standards Board Standard No. 1, *Independence Discussions with Audit Committees*), as adopted by the Public Company Accounting Oversight Board in Rule 3600T, and has discussed with our registered public accounting firm its independence.

Based on the review and discussions referred to above, the Audit Committee recommended to our Board of Directors that the audited financial statements be included in our Annual Report on Form 10-K for the year ended December 31, 2018.

Respectfully submitted,

Gregory R. Beecher, Chair

Jacqueline F. Moloney

Elizabeth A. Mora

Principal Accountant Fees and Services

For the years ended December 31, 2018 and 2017, aggregate fees for professional services rendered by our independent registered public accounting firm, PwC, in the following categories were as follows:

	2018	2017
Audit Fees	\$3,396,704	\$3,526,135
Audit-Related Fees	78,620	150,000
Tax Fees	389,613	286,239
All Other Fees	2,700	2,700

Total	\$3,867,637	\$3,965,074
-------	-------------	-------------

Audit Fees

Audit fees billed for both years consisted of fees for professional services rendered for: (i) the audit of our annual consolidated financial statements, (ii) statutory audits, (iii) the review of our consolidated financial statements included in our quarterly reports on Form 10-Q, (iv) audit services related to other reports filed with the SEC, and (v) the audit of our internal controls over financial reporting as required by the rules and regulations promulgated under Section 404 of the Sarbanes-Oxley Act of 2002.

Table of Contents

Audit-Related Fees

Audit-Related fees for the year ended December 31, 2018 were for professional services associated with a new leasing accounting standard, ASC 842. Audit-related fees for the year ended December 31, 2017 were for professional services associated with a new revenue recognition accounting standard.

Tax Fees

Tax Fees for the year ended December 31, 2018 were for services related to tax compliance, including the preparation of tax returns, and tax planning and tax advice, including assistance with foreign operations and foreign tax audits. Tax Fees for the year ended December 31, 2017 were for services related to tax compliance, including the preparation of tax returns, and tax planning and tax advice, including assistance with foreign operations and foreign tax audits.

All Other Fees

All Other Fees for the years ended December 31, 2018 and 2017 were for accounting research software.

In 2018 and 2017, all Audit Fees, Audit-Related Fees, Tax Fees and All Other Fees were pre-approved pursuant to the Audit Committee's pre-approval requirements, described below.

Pre-Approval Policy and Procedures

The Audit Committee's charter sets forth the Audit Committee's obligations relating to the approval of all audit and non-audit services that are to be performed by our independent registered public accounting firm. The charter provides that we will not engage our independent registered public accounting firm to provide audit or non-audit services unless the service is pre-approved by the Audit Committee. In addition, we will not engage any other accounting firm to provide audit services unless such services are pre-approved by the Audit Committee. It is the Audit Committee's policy that with respect to services performed or to be performed by PwC in connection with each fiscal year of the Company, the annual fees for non-audit services in such year shall not exceed one half of the aggregate fees payable to PwC for such year, without the prior express approval of the Audit Committee.

In connection with the foregoing, the Audit Committee may approve specific services in advance. In addition, from time to time, the Audit Committee may pre-approve specified types of services that are expected to be provided to us by our independent registered public accounting firm during the next 12 months. Any such pre-approval of types of services is detailed as to the particular service or type of service to be provided and is also generally subject to a maximum dollar amount.

The Audit Committee has also delegated to the Chair of the Audit Committee the authority to approve any audit or non-audit services to be provided to us by our independent registered public accounting firm. Any approval of services by the Chair of the Audit Committee pursuant to this delegated authority is reported on at the next meeting of the Audit Committee.

The Audit Committee has considered and determined that the provision of the non-audit services noted in the foregoing table is compatible with maintaining PwC's independence.

Table of Contents

**SECURITY OWNERSHIP OF CERTAIN BENEFICIAL
OWNERS AND MANAGEMENT**

The following table sets forth certain information with respect to the beneficial ownership of our Common Stock by (i) each shareholder known to us to be the beneficial owner of more than 5% of the outstanding shares of our Common Stock; (ii) the Named Executive Officers named in the Summary Compensation Table below; (iii) each of our current directors and director nominee; and (iv) all of our directors and executive officers as a group. Unless otherwise indicated in the footnotes to the table, all equity amounts set forth in the table are as of January 1, 2019; and the address for each of our directors and executive officers is: c/o MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810.

Name of Beneficial Owners	Number of Shares Beneficially Owned(1)	Percentage of Common Stock Beneficially Owned
<i>5% shareholders</i>		
Black Rock, Inc.	4,960,098(2)	9.18%
40 East 522 nd Street		
New York, NY 10022		
The Vanguard Group, Inc.	4,934,729(3)	9.13%
100 Vanguard Blvd.		
Malvern, PA 19355		
<i>Named Executive Officers</i>		
Gerald G. Colella	126,151(4)	*
John T.C. Lee	17,124(5)	*
Seth H. Bagshaw	43,220(6)	*
John R. Abrams	9,040(7)	*
Dennis L. Werth	61,368(8)	*
<i>Non-Employee Directors; Director Nominee</i>		
Rajeev Batra	-	-
Gregory R. Beecher	20,644	*
John R. Bertucci	365,551(9)	*
Richard S. Chute	6,616	*
Peter R. Hanley	2	*
Rick D. Hess	1,989	*
Jacqueline F. Moloney	5,071	*
Elizabeth A. Mora	13,913	*
Michelle M. Warner (10)	-	-
All directors and executive officers as a group (13 persons)	670,689(11)	1.24%

* Represents less than 1% of the outstanding Common Stock.

- (1) We believe that each shareholder has sole voting and investment power with respect to the shares listed, except as otherwise noted. The number of shares beneficially owned by each shareholder is determined under SEC rules, and the information is not necessarily indicative of ownership for any other purpose. Under such rules, beneficial ownership includes any shares as to which the person has sole or shared voting or investment power and also any shares that the individual has the right to acquire within 60 days after January 1, 2019, subject to the vesting of RSUs or the exercise of any stock option or other right. The inclusion herein of any shares of Common Stock deemed beneficially owned does not constitute an admission by such shareholder of beneficial ownership of those shares of Common Stock. Percentage ownership calculations are based on 54,039,554 shares of Common Stock outstanding as of January 1, 2019. Shares of Common Stock which an individual or entity has a right to acquire within the 60-day period

Table of Contents

following January 1, 2019, pursuant to the vesting of RSUs or the exercise of any stock options or other right, are deemed to be outstanding for the purpose of computing the percentage ownership of such individual or entity, but are not deemed to be outstanding for the purpose of computing the percentage ownership of any other person or entity shown in the table.

- (2) Based on information set forth in Schedule 13G/A filed by Black Rock, Inc. on February 6, 2019, reporting stock ownership as of December 31, 2018. Black Rock, Inc. has sole voting power with respect to 4,724,019 shares and sole investment power with respect to 4,960,098 shares.
- (3) Based on information set forth in Schedule 13G/A filed by The Vanguard Group, Inc. on February 11, 2019, reporting stock ownership as of December 31, 2018. The Vanguard Group, Inc. has sole voting power with respect to 29,713 shares, shared voting power with respect to 7,104 shares, sole investment power with respect to 4,903,488 shares and shared investment power with respect to 31,241 shares.
- (4) Consists of 77,888 shares held in the name of Mr. Colella's trusts and 48,263 shares subject to RSUs that vest within 60 days after January 1, 2019.
- (5) Consists of 244 shares held directly by Dr. Lee and 16,880 shares subject to RSUs that vest within 60 days after January 1, 2019.
- (6) Consists of 23,311 shares held directly by Mr. Bagshaw and 19,909 shares subject to RSUs that vest within 60 days after January 1, 2019.
- (7) Consists of 109 shares held directly by Mr. Abrams and 8,931 shares subject to RSUs that vest within 60 days after January 1, 2019.
- (8) Consists of 17,188 shares held in the name of Mr. Werth's trust, 17,643 shares subject to RSUs that vest within 60 days of January 1, 2019, and stock-settled stock appreciation rights with respect to 26,537 shares of Common Stock that are exercisable within 60 days of January 1, 2019.
- (9) Consists of 123,796 shares held directly by Mr. Bertucci, 60,000 shares held in the name of Mr. Bertucci's trust, 121,755 shares held directly by Mr. Bertucci's wife and 60,000 shares held in the name of Mrs. Bertucci's trust.
- (10) Director nominee.
- (11) Consists of 532,526 shares held directly or indirectly by such directors and executive officers, 111,626 shares subject to RSUs that vest within 60 days of January 1, 2019, and stock-settled stock appreciation rights with respect to 26,537 shares of Common Stock that are exercisable within 60 days of January 1,

2019.

To our knowledge, there are no voting trusts or similar arrangements among any of the foregoing persons or entities with respect to the voting of shares of Common Stock.

Table of Contents**EXECUTIVE OFFICERS**

The following is a brief summary of the background of each of our current executive officers, other than Mr. Colella, whose background is described under the heading **Directors** above:

Name	Age	Background and Qualifications
John T.C. Lee, President and Chief Operating Officer	56	Dr. Lee has served as our President and Chief Operating Officer since May 2018, and previously served as our Senior Vice President and Chief Operating Officer from November 2016 until May 2018. From January 2014 until October 2016, Dr. Lee served as our Senior Vice President of Business Units. From November 2012 until December 2013, Dr. Lee served as our Senior Vice President, Controls, HPS (our integrated process solutions business), and Pressure, Flow, Measurement and Control, or PFMC. From January 2011 to November 2012, he served as Senior Vice President, Controls and PFMC, and from October 2007 to January 2011, he served as our Group Vice President, Controls and Information Technology products. Prior to joining MKS, Dr. Lee served as the Managing Director of Factory Technology and Projects within the Solar Business Group at Applied Materials, Inc., a global leader providing processing equipment to the semiconductor and display markets, from February 2007 until October 2007. From 2002 until 2007, he served as General Manager of the Cleans Product Group and the Maydan Technology Center at Applied Materials. Prior to Applied Materials, Dr. Lee served from 1997 until 2002 as Research Director of the Silicon Fabrication Research Department at Lucent Technologies, Inc., a voice, data and video communications provider, and from 1991 until 1997 as a Member of the Technical Staff in the Plasma Processing Research Group within Bell Labs. Dr. Lee holds a B.S. from Princeton University and both an M.S.C.E.P. and a Ph.D. from the Massachusetts Institute of Technology, all in Chemical Engineering.
Seth H. Bagshaw, Senior Vice President, Chief Financial Officer and Treasurer	59	Mr. Bagshaw has served as our Senior Vice President and Chief Financial Officer since May 2017 and as Treasurer since March 2011. From January 2010 to May 2017, he served as our Vice President and Chief Financial Officer. From March 2006 until January 2010, Mr. Bagshaw served as our Vice President and Corporate Controller. Prior to joining MKS, Mr. Bagshaw served as Vice President and Chief Financial Officer of Vette Corp., an integrated global supplier of thermal management systems, from 2004 until 2006. From 1999 until 2004, Mr. Bagshaw served as Vice President and Corporate Controller of Varian Semiconductor Equipment Associates, Inc., a leading producer of ion implantation equipment used in the semiconductor manufacturing industry, and from 1998 until 1999, he served as Vice President and Chief Financial Officer of Palo Alto Products International, Inc., an industrial design, engineering and manufacturing company, until its acquisition by Flextronics International, Ltd. Prior to that, Mr. Bagshaw held several senior financial management positions at Waters Corporation, a developer of innovative analytical science solutions, most recently as Vice President and Chief Financial Officer of its Asia-Pacific region, and was a Senior Manager at

PricewaterhouseCoopers LLP. Mr. Bagshaw has been a member of the Board of Directors of Associated Industries of Massachusetts, a non-profit state-wide employer advocacy and service organization, since 2010 and has served on its Audit Committee since 2014. Mr. Bagshaw is a Certified Public Accountant and has a B.S. in Business Administration from Boston University and an M.B.A. from Cornell University.

Our executive officers are appointed by the Board of Directors on an annual basis and serve until their successors are duly appointed and qualified. There are no family relationships among any of our executive officers or directors.

Table of Contents**EXECUTIVE COMPENSATION****Compensation Discussion and Analysis*****Introduction***

The purpose of this section of our proxy statement is to provide an overview of our executive compensation program, our compensation philosophy and objectives, and the material decisions we made with respect to each element of our executive compensation program. Throughout this proxy statement, we refer to the following Named Executive Officers:

Name	Title
Gerald G. Colella	Chief Executive Officer
John T.C. Lee	President and Chief Operating Officer
Seth H. Bagshaw	Senior Vice President, Chief Financial Officer and Treasurer
John R. Abrams(1)	Former Senior Vice President of Global Sales
Dennis L. Werth(2)	Former Senior Vice President of Business Units

(1) Mr. Abrams retired on February 28, 2019.

(2) Mr. Werth transitioned to the role of advisor effective January 2, 2019 and will retire on July 5, 2019. Following this Compensation Discussion and Analysis, you will find a series of tables containing specific information about the compensation earned or paid in 2018 to our Named Executive Officers.

Executive Summary***Our Business***

We are a global provider of instruments, subsystems and process control solutions that measure, monitor, deliver, analyze, power and control critical parameters of advanced manufacturing processes to improve process performance and productivity for our customers. Our products are derived from our core competencies in pressure measurement and control, flow measurement and control, gas and vapor delivery, gas composition analysis, residual gas analysis, leak detection, control technology, ozone generation and delivery, power, reactive gas generation, vacuum technology, lasers, photonics, sub-micron positioning, vibration control, optics and laser-based manufacturing solutions. We also provide services relating to the maintenance and repair of our products, installation services and training. Our primary served markets include semiconductor, industrial technologies, life and health sciences, research and defense.

Company Performance in 2018 and Financial Highlights

2018 was another outstanding year for MKS as revenue and earnings per share both set new Company records. Five years ago, we set a strategy of delivering sustainable and profitable growth. One of the focus areas has been to enhance our strong semiconductor market portfolio while broadening our reach into advanced markets, which include

industrial technologies, life and health sciences, research and defense. We have executed on this strategy with a combination of successfully integrating key acquisitions, strengthening our product portfolio and enhancing our go-to-market strategies for these new markets.

On February 1, 2019, we completed our acquisition of Electro Scientific Industries, Inc., or ESI, an innovator in laser-based manufacturing solutions for the micro-machining industry. Our acquisition of ESI is another significant step in executing our broadening our market reach strategy, expanding our addressable market by approximately \$2.2 billion. The acquisition also provides MKS with a very balanced portfolio, with approximately 51% of our combined revenue in 2018 coming from advanced markets, and 49% from the semiconductor market, on a pro forma basis, reflecting the full year results of ESI. We expect the addition of ESI to strengthen our expertise in the lasers, photonics and optics markets, enabling us to develop systems that provide unique and cost-effective solutions to meet the challenges of our customers evolving technology needs.

Table of Contents

In addition, MKS accomplished the following in 2018:

sales were a record \$2.1 billion, an increase of 8% from \$1.9 billion in 2017, driven by strong sales to our semiconductor customers, specifically during the first half of the year, as well as customers in our advanced markets;

sales in our Vacuum and Analysis Division grew by 4% over 2017 to \$1.3 billion, driven by strong sales to our semiconductor customers during the first half of 2018 and sales to our advanced markets customers throughout the year; sales in our Light and Motion Division were \$814 million, an increase of 15% from \$709 million in 2017, driven by both sales to our semiconductor customers as well as our industrial manufacturing customers;

net income increased to \$393 million in 2018 from \$339 million in 2017, or 16%;

diluted net income per share increased to \$7.14 in 2018 from \$6.16 in 2017, or 16%;

we returned \$42 million to MKS shareholders in cash dividends; and

we continued integrating the sales function to support cross selling of products from both of our Divisions.

2018 Compensation Outcomes

Our executive compensation program is designed to reward our Named Executive Officers for performance and to align their interests with those of our shareholders. As a result of our strong financial results in 2018, our Named Executive Officers, other than Mr. Werth, received 103% of their target variable cash compensation tied to non-GAAP operating income and 102% of their target performance-based equity compensation tied to non-GAAP cash flow from operations. Mr. Werth received 180% of his target variable cash compensation and 102% of his target performance-based equity compensation, both tied to the same financial performance metrics described above. We believe these financial performance metrics are important to our shareholders because each is an indicator of how well we manage the operations and capital of our Company. In 2018, the variable cash compensation for all of our executive officers, other than Mr. Werth, was tied to the financial performance of our Company as a whole. The variable cash compensation for Mr. Werth, who headed up our Light and Motion Division, was tied to the financial performance of our Light and Motion Division.

When our Compensation Committee set 2018 executive compensation in early 2018, long-term equity incentive compensation comprised 64.5% of total target compensation for our Chief Executive Officer and 53.8% of total target compensation, on average, for our other Named Executive Officers. Total target compensation is defined as the sum of base salary, target annual cash incentive compensation and target long-term equity incentive compensation. By making equity a substantial component of executive officer compensation, we align our executive officers' long-term interests with those of our shareholders. Also, at least 50% of each Named Executive Officer's target long-term equity incentive compensation is based on a measure of Company performance.

Our annual cash incentive plan is designed to complement our long-term equity incentive plan by focusing on our Company's annual financial performance as measured by non-GAAP operating income. In 2018, our target annual cash incentive compensation comprised 19.4% of total target compensation for our Chief Executive Officer and 20.7% of total target compensation, on average, for our other Named Executive Officers.

In 2018, base salary accounted for 16.1% of total target compensation for our Chief Executive Officer and 25.5% of total target compensation, on average, for our other Named Executive Officers. In 2018, our Chief Executive Officer had 83.9% of his total target compensation opportunity tied to annual and long-term incentive compensation and our other Named Executive Officers, on average, had 74.5% of their total target compensation opportunity tied to annual and long-term incentive compensation.

Consideration of 2018 Advisory Vote on Executive Compensation

At our 2018 Annual Meeting of Shareholders, held on May 9, 2018, we submitted to our shareholders an advisory vote on executive compensation. Although annual advisory "say-on-pay" votes are non-binding, our Compensation Committee has considered, and will continue to consider, the outcome of this vote each year when

Table of Contents

making compensation decisions for our Named Executive Officers. At the 2018 Annual Meeting, our shareholders overwhelmingly approved the compensation of our Named Executive Officers, with approximately 94% of the votes cast voting in favor of the say-on-pay proposal.

The Compensation Committee considered the results of the 2018 say-on-pay vote, and based upon the strong shareholder support, does not believe that our executive compensation program requires material changes. The Compensation Committee will continue to consider the views of our shareholders in connection with our executive compensation program and will consider changes based upon evolving best practices, market compensation information and changing regulatory requirements. The Compensation Committee believes that the 2018 shareholder vote was an endorsement of our compensation and the pay decisions made in relation to our performance.

Compensation Philosophy and Objectives

The primary objective of our executive compensation program is to attract, retain and motivate the critical talent that is required to execute our business strategy and lead us to achieve our long-term growth and earnings goals. This section summarizes our compensation philosophy and objectives relating to our Named Executive Officers.

We target each of the various compensation elements, including base salary, annual cash incentive compensation, and long-term equity incentive compensation, to be within a competitive range around median levels for the individual position in the market. However, this is merely one factor that the Compensation Committee considers and we do not set any specific element or total compensation exactly to the median and, in certain cases, we will and do pay total compensation closer to the 25th and 75th percentiles when appropriate. In considering the compensation of our Named Executive Officers relative to the market, we also look qualitatively at the individual's overall performance, tenure and potential with MKS. Currently, all of our Named Executive Officers are paid within the competitive range of our peer group.

Base salaries are designed to provide executives with a level of predictability and stability with respect to a portion of their total compensation package. Base salaries are a relatively small component in the overall pay packages of our Named Executive Officers because we believe the significant majority of executive compensation should be variable and based on performance.

Our annual cash incentive compensation program provides a short-term incentive to reward management for reaching our annual earnings goals and to reinforce our pay-for-performance philosophy. We believe that our program provides significant incentive for our Named Executive Officers to exceed our financial goals.

We provide our Named Executive Officers with long-term equity incentive compensation in the form of restricted stock units, or RSUs, approximately half of which are performance-based, in order to:

align our executives' interests with those of our shareholders and to reward for operating performance;

balance the short-term focus of annual cash incentive compensation with creating long-term shareholder value; and

retain executives by providing equity-based compensation that generally vests over a three-year period.

Table of Contents

The following charts show the components of total target compensation for our Chief Executive Officer and our other Named Executive Officers as a group for calendar year 2018.

When the Compensation Committee met in July 2017 to review peer companies to be used to determine 2018 executive compensation, the Committee elected to increase the size of the peer group from 14 peer companies to 19 peer companies. Since three of the 14 original peer companies had been acquired in the prior year (FEI Company, Linear Technology Corp. and Mentor Graphics Corporation), the following eight peer companies were added to the peer group: Advanced Energy Industries, Inc., AMETEK, Inc., Keysight Technologies, Inc., KLA-Tencor Corporation, Kulicke and Soffa Industries, Inc., Lumentum Holdings Inc., Microsemi Corporation and Sensata Technologies Holding. The 19 peer companies were selected based on similar industry, market capitalization and revenue, with a revenue range relative to our trailing 12 month revenue as of June 30, 2017 of between .3 to 2.5 times. The Compensation Committee engaged its independent compensation consultant, Meridian, to prepare a competitive compensation analysis for each of our executives on a position-by-position basis based on revenue and market capitalization of the company as of June 30, 2017 of \$1.5 billion and \$3.6 billion, respectively. Publicly available compensation data from the following comparable peer companies was used in determining executive compensation for 2018:

Advanced Energy Industries, Inc.	KLA-Tencor Corporation
AMETEK, Inc.	Kulicke and Soffa Industries, Inc.
Amkor Technology Inc.	Lumentum Holdings Inc.
Brooks Automation, Inc.	Microsemi Corporation
Coherent, Inc.	National Instruments Corporation
Cypress Semiconductor Corp.	Plantronics, Inc.
Entegris, Inc.	Sensata Technologies Holding
Finisar Corp.	Teradyne, Inc.
FLIR Systems, Inc.	Viavi Solutions, Inc. (formerly JDS Uniphase Corporation)
Keysight Technologies, Inc.	

Our Compensation Committee also considered size and industry-appropriate broad survey data from the 2018 Radford Global Technology Survey.

Our executive compensation program is guided by the following principles:

Offer compensation programs that are competitive, on a position-by-position basis, when benchmarked against programs at companies of similar size and in a similar industry.

Reward individual contributions to our financial, operational and strategic objectives.

Reward experience and potential with MKS.

25

Table of Contents

Provide short-term annual performance incentives for management to meet or exceed our performance expectations.

Provide long-term performance-based equity incentive compensation to encourage management to focus on long-term and sustained operating performance and shareholder returns while also factoring in previous grant history and the dilutive impact of equity grants.

Emphasize our pay-for-performance philosophy.

Align our executives' interests with those of our shareholders.

What We Do

Provide maximum payout caps under incentive plans.

Have a clawback policy for incentive-based compensation.

Provide change-in-control benefits only upon a qualified termination of employment.

Review prior levels of compensation when making executive compensation decisions.

Have stock ownership guidelines.

Have a fully independent Compensation Committee.

Utilize an independent compensation consultant.

What We Do Not Do

x No repricing of underwater options without shareholder approval.

x No hedging or pledging of MKS shares.

No incentives for excessive risk taking.

No excessive perquisites.

Elements of Compensation

The following summarizes the compensation elements for our Named Executive Officers:

Base Salary

When our Compensation Committee set 2018 annual executive compensation in February 2018, it approved a salary increase of approximately 21% for Mr. Colella, our Chief Executive Officer, and a salary increase, on average, of approximately 4% for each of Dr. Lee, our President and Chief Operating Officer, Mr. Bagshaw, our Chief Financial Officer, Mr. Abrams, our Senior Vice President of Global Sales and Mr. Werth, our Senior Vice President of Business Units. These increases were based on the compensation data collected from our peer group. The Compensation Committee increased Mr. Colella's salary by 21% after reviewing the compensation data collected from our peer group and considering the strong financial performance of the Company under his leadership, including the integration of our acquisition of Newport Corporation, or Newport, as well as the Company's achievement of other strategic initiatives. Dr. Lee received a further increase in salary in May 2018 when he was promoted from Senior Vice President and Chief Operating Officer to President and Chief Operating Officer of the Company. Between the increase in February 2018 and the increase in May 2018, Dr. Lee's 2018 salary was 6% higher than his 2017 salary.

Annual Cash Incentive Compensation

For 2018, the Compensation Committee made the following two changes to our annual cash incentive program compared to 2017:

The first change was in response to the passage of the Tax Cuts and Jobs Act, or the Tax Act, that was signed into law in December 2017 and the resulting overhaul of Section 162(m) of the Internal Revenue Code of 1986, as amended, or Section 162(m). Prior to the Tax Act, Section 162(m) generally disallowed a tax deduction to public companies for compensation in excess of \$1 million per person

Table of Contents

paid to a company's chief executive officer and the next three most highly-paid executive officers, excluding the chief financial officer. Historically, qualified performance-based compensation was not subject to the deduction limit so long as certain requirements were met. Prior to 2018, our Compensation Committee structured our annual cash incentive compensation so that it met these requirements creating an umbrella structure over an underlying annual cash incentive plan. With the Tax Act's elimination of the performance-based compensation exception to the deduction limitation, the Compensation Committee simplified the structure of our annual cash incentive compensation program by eliminating the umbrella structure, leaving in place our underlying annual cash incentive plan.

The second change was the removal of the individual performance component of our annual cash incentive plan so that all executive officer annual bonuses would be based entirely on Company financial performance, or in the case of Mr. Werth, divisional financial performance. Although for the prior two years the Compensation Committee had included individual performance objectives in our annual cash incentive plan, the Compensation Committee concluded that the best way to achieve the highest level of performance was for every executive officer to be singularly focused on the same Company or divisional financial performance objectives. As a result, individual performance objectives were eliminated from the 2018 annual cash incentive plan.

Under our annual cash incentive plan, each Named Executive Officer was eligible to receive a performance bonus based on a specified percentage of eligible earnings, which is defined as eligible W-2 earnings received during the 2018 calendar year (i.e., base salary, including regular, holiday, vacation and sick pay, but excluding bonus payments). Bonus payouts in 2018, except for Mr. Werth, were based entirely on non-GAAP operating income after bonus and excluding any charges or income not related to the operating performance of the Company. Mr. Werth's bonus payout in 2018 was based entirely on non-GAAP operating income after bonus and excluding any charges or income not related to the operating performance of the Company's Light and Motion Division.

In 2018, payouts under the annual cash incentive plan were determined by multiplying a Named Executive Officer's Target Bonus Amount by the Company's percentage achievement of the financial performance objective, each as discussed below. Target Bonus Amount is the amount determined by multiplying each Named Executive Officer's eligible earnings in 2018 by the Target Bonus percentages determined by our Compensation Committee each year. When our Compensation Committee set 2018 annual executive compensation in early 2018, it did not approve any increases to Target Bonus percentages for our Named Executive Officers except for Mr. Colella. The Compensation Committee increased Mr. Colella's Target Bonus percentage by 15 percentage points after reviewing the compensation data collected from our peer group and considering the strong financial performance of the Company under Mr. Colella's leadership, including the integration of the Newport acquisition as well as the Company's achievement of other strategic initiatives.

Dr. Lee received a Target Bonus percentage increase of five percentage points in May 2018 when he was promoted from Senior Vice President and Chief Operating Officer to President and Chief Operating Officer of the Company. This increase took effect on May 9, 2018 resulting in the blended rate listed below for 2018.

Listed below is the 2018 Target Bonus Percentage for each Named Executive Officer.

Named Executive Officer	2018 Target Bonus Percentage
Gerald G. Colella	120%
John T.C. Lee	93.1%

Seth H. Bagshaw	80%
John R. Abrams	80%
Dennis L. Werth	75%

In 2018, participants, other than Mr. Werth, would not receive any portion of their Target Bonus Amount if non-GAAP operating income (before the calculation of bonus) was less than \$272.3 million. Participants would receive 50% of their Target Bonus Amount if such non-GAAP operating income was \$272.3 million, would

Table of Contents

receive 100% of their Target Bonus Amount if such non-GAAP operating income was \$544.5 million, and would receive the maximum 200% if such non-GAAP operating income was \$584.7 million or more, with proportional payments for achievement in between these levels. In 2018, because our non-GAAP operating income, after bonus and excluding amortization of intangible assets, restructuring charges, a legal settlement and acquisition related costs, was \$545.6 million, participants were eligible to receive 103% of their Target Bonus Amounts under this formula. Mr. Werth would not receive any portion of his Target Bonus Amount if such non-GAAP operating income was less than the minimum threshold of \$100.0 million. He would receive 50% of his Target Bonus Amount if such non-GAAP operating income was \$100.0 million, would receive 100% if such non-GAAP operating income was \$200.0 million, and would receive the maximum 200% if such non-GAAP operating income was \$213.6 million or more, with proportional payments for achievement in between. In 2018, because the Light and Motion Division's non-GAAP operating income, after bonus and excluding amortization of intangible assets, restructuring charges, a legal settlement and acquisition related costs, was \$210.9 million, Mr. Werth was eligible to receive 180% of his Target Bonus Amount under this formula.

Listed below are our Chief Executive Officers and other Named Executive Officers' earned cash bonus payouts.

Named Executive Officer	Cash Payout	Payment as a Percent of Target
Gerald G. Colella	\$ 1,227,681	103%
John T.C. Lee	\$ 520,104	103%
Seth H. Bagshaw	\$ 419,606	103%
John R. Abrams	\$ 324,054	103%
Dennis L. Werth	\$ 619,183	180%

Our Compensation Committee has the authority to make other cash bonus awards to our Named Executive Officers as it deems appropriate. On February 10, 2019, the following Named Executive Officers were awarded a discretionary cash bonus equal to 10% of his 2018 Target Bonus Amount for achieving significant cost savings in the second half of 2018 in response to a slowdown in the Company's semiconductor business for this period.

Named Executive Officer	Discretionary Cash Bonus	Payment as a Percent of Target
Gerald G. Colella	\$ 119,192	10%
John T.C. Lee	\$ 50,496	10%
Seth H. Bagshaw	\$ 40,728	10%
John R. Abrams	\$ 31,462	10%

Our Compensation Committee did not make any design changes to our 2019 annual cash incentive program. For all Named Executive Officers Company performance will be measured using the same financial metric as in previous years' non-GAAP operating income after bonus and excluding any charges or income not related to the operating performance of the Company.

Table of Contents*Long-Term Equity Incentive Compensation*

When our Compensation Committee set 2018 annual executive compensation in early 2018, it awarded the following time-based and performance-based RSUs to our Chief Executive Officer and our other Named Executive Officers. These RSUs vest in three equal annual installments. The performance-based RSUs are subject to a one-year performance metric described below.

Named Executive Officer	Grant Date Value of Performance-Based RSUs(1)	Number of Performance-Based RSUs(1)	Grant Date Value of Time-Based RSUs	Number of Time-Based RSUs
Gerald G. Colella	\$ 2,250,000	20,252	\$ 1,750,000	15,751
John T.C. Lee	\$ 650,000	5,850	\$ 650,000	5,850
Seth H. Bagshaw	\$ 750,000	6,750	\$ 650,000	5,850
John R. Abrams	\$ 350,000	3,150	\$ 350,000	3,150
Dennis L. Werth	\$ 350,000	3,150	\$ 350,000	3,150

(1) Grant date value of performance-based RSU award and corresponding number of RSUs assuming 100% achievement. Achievement is capped at 150%.

With respect to performance-based RSUs, our goal is to select a Company financial performance metric that best aligns with our Company objectives. Recently, including in 2018, our Company financial performance metric for performance-based RSUs has been adjusted cash flow from operations (defined as net income plus depreciation, amortization and non-cash stock-based compensation and excluding special items set forth in Section 9(c)(i) through (xiv) of our 2014 Stock Incentive Plan) set at varying revenue levels. Our Compensation Committee believes this financial metric is an appropriate indicator of how well we manage the operations of our Company.

We use RSUs as our form of equity incentive compensation because we believe RSUs help to ensure that our executive officers' interests are aligned with our shareholders' in both a rising and a declining stock market. We believe RSUs are preferable to options, which have a relatively high accounting cost as compared to their potential value to the executive officer, and are preferable to restricted stock, which gives the executive officer voting and dividend rights prior to full vesting. Also, because RSUs are worth more than options on the date of grant, we are able to grant fewer of these as compared to options, resulting in less dilution to shareholders' holdings.

In 2018, our Named Executive Officers would have forfeited all of their performance-based RSUs if our adjusted cash flow from operations was less than \$334.1 million at a revenue level of \$1.85 billion, or if such cash flow was less than \$482.5 million at a revenue level of \$2.3 billion (with intermediate adjusted cash flow minimum thresholds at different revenue levels in between). However, if we did achieve these adjusted operating cash flow threshold levels at the respective revenue levels identified, our Named Executive Officers would receive 50% of their target performance-based RSUs. If our adjusted cash flow from operations was at or above \$451.0 million at a revenue level of \$1.85 billion, or was at or above \$651.5 million at a revenue level of \$2.3 billion (with proportional thresholds in between), then our Named Executive Officers would receive the maximum of 150% of their target performance-based RSUs. Proportional payments would be made for adjusted cash flow achievements between the minimum and maximum levels. In 2018, because our revenue was \$2.1 billion and our adjusted cash flow was \$509.1 million, after excluding restructuring charges, a legal settlement, acquisition-related costs and the tax effect of each of these

excluded costs, in addition to amortization of intangible assets, depreciation of fixed assets and stock-based compensation expense, our Named Executive Officers received 102% of their target performance-based RSUs. These performance-based RSUs, along with the time-based RSUs granted to our Named Executive Officers, vest in equal annual installments over three years from the original date of grant.

Dr. Lee received an additional award of 771 time-based RSUs and 771 performance-based RSUs (at target achievement and capped at 1,157 RSUs at maximum achievement of 150% of target) in May 2018 when he was promoted from Senior Vice President and Chief Operating Officer to President and Chief Operating Officer of

Table of Contents

the Company. These RSUs vest in three equal annual installments beginning February 15, 2019. The performance-based RSUs were also subject to the same one-year performance metric described above.

It is our practice to make an initial equity-based grant to all of our Named Executive Officers at the time they commence employment, in an amount that is consistent with amounts granted to other executive officers in the industry at similar levels of seniority. In addition, we typically make an annual grant of equity-based compensation to our Named Executive Officers during the first fiscal quarter of each year. Discretionary equity-based grants may be made throughout the year to provide an incentive to achieve a specific goal or to reward a significant achievement. Our Compensation Committee did not make any discretionary equity-based awards to our Named Executive Officers in 2018.

Supplemental Retirement Benefits

We provide supplemental retirement benefits, including supplemental lifetime retiree medical benefits, to our current Chief Executive Officer, Mr. Colella, or, in the event of his death, to his spouse. These supplemental retirement benefits were designed to reward Mr. Colella's long service with us and to serve as a significant incentive for Mr. Colella to remain with us because these benefits will vest in full upon Mr. Colella maintaining his employment with us until age 62, with specified exceptions. Mr. Colella, who first joined our Company in 1983 as our Materials Planning and Logistics Manager, served in numerous capacities over the course of the next thirty plus years to ultimately become our Chief Executive Officer.

Since 2011, it has been our policy not to offer these types of retirement benefits to other Named Executive Officers. While these benefits were attractive elements to retain certain of our most senior executive officers historically, the elimination of these benefits more closely meets our objective to align executive compensation with Company financial performance.

Perquisites

We offer certain perquisites to our Named Executive Officers to allow executives to focus on corporate strategy and enhancing shareholder value and to provide competitive pay packages. These perquisites include car payments, company paid health and life insurance, reimbursement of certain out-of-pocket healthcare costs, golf club memberships, financial planning benefits and executive physicals. We believe offering these benefits is important to maintaining a competitive position in attracting and retaining key personnel and these benefits are consistent with market practices.

Severance and Change-in-Control Provisions

Each of our Named Executive Officers, other than Mr. Abrams who entered into a Transition and Retirement Agreement with the Company on May 9, 2018 as described below, is entitled to certain payments and benefits in the event his employment terminates under specified circumstances as described in the applicable agreement. In exchange for these payments and benefits, each Named Executive Officer, other than Mr. Werth, whose agreement is governed by California law, is restricted from competing with the Company during and following his termination of employment for a twelve-month period. In addition, RSU agreements with our Named Executive Officers, or in Mr. Werth's case, solely with respect to certain of his RSU agreements, provide for acceleration of vesting in the event the executive's employment is terminated without cause or the executive resigns for good reason within 24 months after a change-in-control. The severance and change-in-control provisions are designed to be competitive in the marketplace, to provide security for our Named Executive Officers in the event that we are acquired and his respective position is impacted and to provide an incentive for the Named Executive Officer to stay with us through such a

change-in-control event. These provisions are also intended to protect us from competitive harm, by compensating our Named Executive Officers for agreeing to substantial non-compete provisions after employment termination. See Executive Compensation Tables Potential Payments Upon Termination or Change-in-Control for more information about these agreements.

Table of Contents

Transition and Retirement Agreement

On May 9, 2018, Mr. Abrams entered into a Transition and Retirement Agreement with the Company. Mr. Abrams retired on February 28, 2019. Mr. Abrams' Transition and Retirement Agreement superseded and replaced the Employment Agreement that he entered into with the Company effective August 1, 2016. For a detailed discussion of the material terms of the Transition and Retirement Agreement, see Executive Compensation Tables Potential Payments Upon Termination or Change-in-Control.

Compensation of our Chief Executive Officer

We entered into an employment agreement with Mr. Colella upon his becoming Chief Executive Officer and President in January 2014. The terms of Mr. Colella's employment agreement reflect his role as the leader of our Company and the experience he brought to the position having served more than 30 years at MKS. For a detailed discussion of the material terms of Mr. Colella's employment agreement, including all amendments to this employment agreement, see Executive Compensation Tables Potential Payments Upon Termination or Change-in-Control.

Compensation of our Other Named Executive Officers

We have entered into employment agreements with each of our other Named Executive Officers. For a detailed discussion of the material terms of these executive employment agreements, including all amendments to these employment agreements, see Executive Compensation Tables Potential Payments Upon Termination or Change-in-Control.

Compensation Consultant

We engage a compensation consultant to serve as an independent advisor to the Compensation Committee regarding compensation for our directors and our executive officers. The Compensation Committee utilizes the compensation consultant in the following ways:

to provide the Compensation Committee with occasional consultation regarding compensation strategies and programs;

to review our peer group to determine the appropriateness of its composition;

to conduct formal competitive compensation analysis for the Compensation Committee regarding our directors and each executive officer, on a position-by-position basis, in comparison to similarly situated executive officers in our peer group using benchmarking data; and

to assist the Compensation Committee with conducting a risk assessment of the Company's compensation policies and practices.

Since October 2014, the Compensation Committee has engaged Meridian as its compensation consultant. The Compensation Committee determined that the engagement of Meridian as a compensation consultant did not raise any conflicts of interest with MKS.

Role of our Chief Executive Officer

Our Chief Executive Officer reviews with the Compensation Committee the performance of all other Named Executive Officers and makes recommendations relating to compensation of such executive officers. Management develops proposed company financial goals for review and approval by the Compensation Committee for the annual cash incentive plan and long-term performance-based equity incentive compensation, develops proposals relating to potential changes in compensation programs for review and approval by the Compensation Committee and provides the Compensation Committee and its advisors with information necessary to evaluate and implement compensation proposals and programs. Our Chief Executive Officer does not participate in discussions regarding his own compensation.

Table of Contents

Governance Policies

Stock Ownership Guidelines

Our Stock Ownership Guidelines, which are applicable to members of the Board of Directors, the Chief Executive Officer and any other person who is or was a Named Executive Officer while the guidelines are effective, provide that:

Members of the Board of Directors shall own an amount of stock of the Company with a value equal to at least five times the annual retainer for Board service (exclusive of any compensation for committee service, meeting fees, leadership roles and the like).

The Chief Executive Officer shall own an amount of stock of the Company with a value equal to at least three times his or her annual base salary (excluding any bonus, award or special compensation).

Other Named Executive Officers shall own an amount of stock of the Company with a value equal to at least two times his or her annual base salary (excluding any bonus, award or special compensation).

These guidelines are based, in each case, on values in effect as of December 31 of the applicable year.

We adopted the Stock Ownership Guidelines in 2013 and they provide for a phase-in period over five years to achieve the respective ownership goals. We modified these guidelines to increase the threshold for directors from four times the annual retainer to five times effective in 2018.

Clawback Policy

Our Clawback Policy, which is applicable to incentive-based compensation (specifically our cash incentive plan and our performance-based RSUs) that is awarded to Named Executive Officers, provides that in the event we are required to prepare an accounting restatement due to material noncompliance with financial reporting requirements, we will use reasonable efforts to recover any amount in excess of what would have been paid to such Named Executive Officers (or such former Named Executive Officers) under the accounting restatement for any such incentive-based compensation during the three-year period preceding the restatement.

Prohibition on Hedging and Pledging

Our Insider Trading Policy prohibits any of our directors or employees from engaging in transactions involving financial instruments that are designed to hedge or offset any decrease in the market value of our securities (including pre-paid variable forward contracts, equity swaps, collars and exchange funds), and prohibits such individuals from purchasing our securities on margin or pledging such securities as collateral for a loan.

Impact of Accounting and Tax on Executive Compensation

Impact of Code Section 162(m)

Section 162(m) of the Internal Revenue Code of 1986, as amended, or the Code, generally disallows a tax deduction to public companies for compensation in excess of \$1 million paid to each of the company's chief executive officer and the next three most highly compensated executive officers (other than the chief financial officer). Pursuant to tax legislation signed into law on December 22, 2017, or the Tax Act, for taxable years beginning after December 31, 2017, the Section 162(m) deduction limitation is expanded so that it also applies to compensation in excess of \$1 million paid to a public company's chief financial officer. Historically, compensation that qualified under Section 162(m) as performance-based compensation was exempt from the deduction limitation. However, subject to certain transition rules, the Tax Act eliminated the qualified performance-based compensation exception. As a result, for taxable years beginning after December 31, 2017, all compensation in excess of \$1 million paid to each of the Named Executive Officers described above will not be deductible by us.

Table of Contents

Impact of ASC 718

We account for stock-based compensation in accordance with the requirements of ASC 718. The Compensation Committee considers the impact of ASC 718 on our use of equity incentives as a key retention tool. The Compensation Committee regularly reviews its choice of equity instruments, taking into account both tax and accounting considerations.

COMPENSATION COMMITTEE REPORT

The Compensation Committee has reviewed and discussed the Compensation Discussion and Analysis required by Item 402(b) of Regulation S-K with management. Based on such review and discussions, the Committee recommended to the Board of Directors that the Compensation Discussion and Analysis be included in this proxy statement.

Respectfully submitted,

Elizabeth A. Mora, Chair

Rajeev Batra

Peter R. Hanley

Rick D. Hess

Table of Contents**EXECUTIVE COMPENSATION TABLES****Summary Compensation Table for 2018**

The following table sets forth the aggregate amounts of compensation earned by our Named Executive Officers in the years ended December 31, 2018, 2017 and 2016:

Name and Principal Position	Year	Salary (\$)	Bonus (\$)	Awards (\$)	Stock Plan Compensation (\$)	Non-Equity Incentive Plan Compensation (\$)	Change in Pension Value and Deferred Compensation (\$)	All Other Compensation (\$)	Total (\$)
Gerald G. Colella, Chief Executive Officer (principal executive officer)	2018	\$ 993,269	\$ 119,192	\$ 4,000,000	\$ 1,227,681	\$ 3,855,922	\$ 64,141	\$ 10,260,205	
	2017	\$ 824,038	-	\$ 3,000,000	\$ 1,730,481	\$ 2,824,538	\$ 63,664	\$ 8,442,721	
	2016	\$ 757,731	-	\$ 2,700,000	\$ 1,018,390	\$ 2,038,038	\$ 62,855	\$ 6,577,014	
John T. C. Lee, President and Chief Operating Officer	2018	\$ 542,431	\$ 50,496	\$ 1,475,000	\$ 520,104	N/A	\$ 70,898	\$ 2,658,929	
	2017	\$ 514,423	-	\$ 1,000,000	\$ 925,961	N/A	\$ 68,601	\$ 2,508,985	
	2016	\$ 455,882	-	\$ 950,000	\$ 467,781	N/A	\$ 71,000	\$ 1,944,663	
Seth H. Bagshaw, Sr. Vice President, Chief Financial Officer and Treasurer (principal financial officer)	2018	\$ 509,231	\$ 40,728	\$ 1,400,000	\$ 419,606	N/A	\$ 60,628	\$ 2,430,193	
	2017	\$ 489,423	-	\$ 1,200,000	\$ 783,076	N/A	\$ 62,365	\$ 2,534,864	
	2016	\$ 456,707	-	\$ 1,230,000	\$ 520,280	N/A	\$ 67,448	\$ 2,274,435	
John R. Abrams, Sr. Vice President of Global Sales	2018	\$ 393,269	\$ 31,462	\$ 700,000	\$ 324,054	N/A	\$ 52,690	\$ 1,501,475	
	2017	\$ 373,462	-	\$ 600,000	\$ 597,539	N/A	\$ 64,013	\$ 1,635,014	
	2016	\$ 323,654	-	\$ 525,000	\$ 342,814	N/A	\$ 52,010	\$ 1,243,478	
Dennis L. Werth, Sr. Vice President of Business Units(6)	2018	\$ 458,654	-	\$ 700,000	\$ 619,183	N/A	\$ 52,375	\$ 1,830,212	
	2017	\$ 432,692	-	\$ 728,908	\$ 616,587	N/A	\$ 58,696	\$ 1,836,883	
	2016	\$ 277,115	-	\$ 1,204,400	\$ 274,284	N/A	\$ 18,030	\$ 1,773,829	

(1)

Represents a discretionary cash bonus equal to 10% of the Named Executive Officer's 2018 Target Bonus Amount for achieving significant cost savings in the second half of 2018 in response to a slowdown in the Company's semiconductor business for this period.

- (2) Represents the aggregate grant date fair value for each RSU granted to the executive officer during the covered year, calculated in accordance with ASC 718. The assumptions used in determining the aggregate grant date fair values of awards are set forth in Note 16 to our consolidated financial statements, which were included in our 2018 Annual Report filed with the SEC on February 26, 2019. The amounts under the "Stock Awards" column do not reflect the amount of compensation actually received by the Named Executive Officers during the fiscal year. At least fifty percent of the values listed under "Stock Awards" represent performance-based RSUs which are valued at the grant date based upon the probable outcome of the performance metrics. The maximum value of the RSUs, assuming the highest level of performance is achieved for the performance-based portion of the RSUs, was as follows for 2018, 2017 and 2016:

Named Executive Officer	2018		2017		2016	
	Maximum	Actual	Maximum	Actual	Maximum	Actual
Gerald G. Colella	\$5,125,000	\$4,045,000	\$3,750,000	\$3,315,000	\$3,300,000	\$3,060,000
John T.C. Lee	\$1,843,750	\$1,489,750	\$1,250,000	\$1,105,000	\$1,150,000	\$1,070,000
Seth H. Bagshaw	\$1,775,000	\$1,415,000	\$1,500,000	\$1,326,000	\$1,495,000	\$1,389,000
John R. Abrams	\$ 875,000	\$ 707,000	\$ 750,000	\$ 663,000	\$ 625,000	\$ 585,000
Dennis L. Werth	\$ 875,000	\$ 707,000	\$ 903,908	\$ 802,408	\$1,329,400	\$1,201,900

Table of Contents

- (3) Except for Mr. Werth for 2016, each Named Executive Officer's annual cash performance bonus for 2016, 2017 and 2018 was calculated based on a specified target percentage of his eligible earnings for the relevant plan year. The threshold bonus payout was 50% of this individual target bonus percentage and the maximum payout was 200% of this individual target bonus percentage, with proportional payouts for performance between these levels. For 2018, bonus payments were based on a corporate financial performance objective. For 2017 and 2016, bonus payouts were based 80% on a corporate financial performance objective and 20% on individual performance objectives, except for our Chief Executive Officer, whose annual cash performance bonus was based entirely on Company financial performance. Except for Mr. Werth, Company financial performance was based on the achievement of non-GAAP operating income for the 2018, 2017 and 2016 fiscal years (defined as GAAP operating income after bonus and excluding any charges or income not related to the operating performance of the Company). Individual performance was based on specific management by objective goals that were aligned with the Company's strategic objectives and priorities. The individual target bonus percentage and the actual bonus achieved for each of the Named Executive Officers were as follows:

Named Executive Officer	2018		2017		2016			
	Individual Target Bonus %	Annual Bonus Plan Achievement	Individual Target Bonus %	Annual Bonus Plan Achievement	Individual Target Bonus %	Annual Bonus Plan Achievement		
				Company Performance	Individual Performance	Company Performance	Individual Performance	
Mr. Colella	120%	103%	105%	200%	N/A	105%	128%	N/A
Mr. Lee	93.1%	103%	90%	200%	200%	77.5%	128%	150%
Mr. Bagshaw	80%	103%	80%	200%	200%	80%	128%	200%
Mr. Abrams	80%	103%	80%	200%	200%	80%	128%	150%
Mr. Werth	75%	180%	75%	200%	150%	75%*	106%*	N/A

* Represents second half of 2016 only

For 2018 and 2017, Mr. Werth's cash performance bonus terms were substantially similar to the terms for all other Named Executive Officers except that his corporate financial performance metric was non-GAAP operating income for the Light & Motion Division (defined as GAAP operating income after bonus and excluding any charges or income not related to the operating performance of the Light & Motion Division). For 2016, Mr. Werth was eligible to earn a bonus under a Newport executive bonus plan covering the first half of 2016, which we paid in accordance with its terms. The amount equaled 91.3% of his base salary for the first half of 2016. For the second half of 2016, Mr. Werth's cash performance bonus terms were substantially similar to the terms for all other Named Executive Officers except that his individual target bonus percentage was equal to 75% of his eligible earnings for the second half of 2016, his corporate performance metric was non-GAAP operating income for the Light & Motion Division for this six month period (defined as GAAP operating income after bonus and excluding any charges or income not related to the operating performance of the Light & Motion Division) and 100% of his bonus was based on this financial metric. For more information about the annual cash incentive plan, including the maximum bonus opportunity for each, please see Executive Compensation Compensation Discussion and Analysis Elements of Compensation Annual Cash Incentive Compensation.

(4)

Mr. Colella's employment agreement provides for supplemental retirement benefits. For 2018, 2017 and 2016, the amount listed represents the actuarial increase in present value from the prior fiscal year.

Table of Contents

- (5) Executives are eligible to receive payments for car-related expenses, golf club memberships, company-paid health and life insurance, reimbursement of out-of-pocket medical costs, executive physical exams, and 401(k) match.

Named Executive Officer	Year	Auto	Club		Out-of-Pocket		Executive 401(k) Match	Other
			Membership	Insurance	Health	Physical		
Mr. Colella	2018	\$ 16,639	\$ 6,760	\$ 25,769	\$ 3,449	\$ 2,400	\$ 8,250	\$ 874
	2017	\$ 16,329	\$ 6,630	\$ 24,871	\$ 5,784	\$ 1,950	\$ 8,100	-
	2016	\$ 16,664	\$ 6,470	\$ 26,869	\$ 2,952	\$ 1,950	\$ 7,950	-
Dr. Lee	2018	\$ 13,999	\$ 6,760	\$ 37,389	\$ 4,500	-	\$ 8,250	-
	2017	\$ 13,239	\$ 6,630	\$ 36,132	\$ 4,500	-	\$ 8,100	-
	2016	\$ 13,634	\$ 6,470	\$ 38,446	\$ 4,500	-	\$ 7,950	-
Mr. Bagshaw	2018	\$ 9,994	\$ 6,760	\$ 32,059	\$ 1,015	\$ 2,550	\$ 8,250	-
	2017	\$ 9,349	\$ 6,630	\$ 30,786	\$ 4,500	\$ 3,000	\$ 8,100	-
	2016	\$ 10,560	\$ 6,470	\$ 33,229	\$ 4,500	\$ 2,850	\$ 7,950	\$ 1,889
Mr. Abrams	2018	\$ 13,819	-	\$ 26,121	\$ 4,500	-	\$ 8,250	-
	2017	\$ 14,157	\$ 6,630	\$ 30,626	\$ 4,500	-	\$ 8,100	-
	2016	\$ 11,791	-	\$ 31,529	-	-	\$ 7,950	\$ 740
Mr. Werth	2018	\$ 8,736	-	\$ 32,775	\$ 2,614	-	\$ 8,250	-
	2017	\$ 8,400	-	\$ 33,696	\$ 4,500	-	\$ 8,100	\$ 4,000
	2016	\$ 4,200	-	\$ 13,830	-	-	-	-

Reimbursement of out-of-pocket health care costs is capped at \$4,500 annually. Mr. Colella was reimbursed \$5,784 in 2017 for such costs, however, \$1,284 of such amount related to out-of-pocket healthcare costs incurred in 2016 but submitted for reimbursement in 2017. With respect to the Other column, amounts indicated for Messrs. Colella, Bagshaw and Abrams related to a gift card and associated tax gross-up and the amount indicated for Mr. Werth related to financial planning services.

- (6) Mr. Werth joined the Company on April 29, 2016 in connection with the Company's acquisition of Newport.
CEO Pay Ratio

We are required by Section 953(b) of the Dodd-Frank Act and Item 402(u) of Regulation S-K to disclose the ratio of our median employee's annual total compensation to the annual total compensation of our principal executive officer.

The purpose of this disclosure is to provide a measure of the equitability of pay within our Company. We believe our compensation philosophy and process yield an equitable result for all of our employees. During 2018, our principal executive officer was our Chief Executive Officer, Gerald Colella. For 2018, the combined annual total compensation for Mr. Colella was \$10,260,205, and for our median employee was \$77,485, resulting in a pay ratio of approximately 132:1.

In accordance with Item 402(u) of Regulation S-K, we identified the median employee as of December 18, 2017 (the median employee determination date) by (i) aggregating for each applicable employee (A) annual base salary for salaried employees (or hourly rate multiplied by expected annual work schedule for hourly employees), (B) the actual bonus, commissions and overtime or double-time received for 2017, and (C) the accounting value of any equity

granted during 2017, and (ii) ranking this compensation measure for our employees from lowest to highest. This calculation was performed for all employees, excluding Mr. Colella, whether employed on a full-time, part-time, or seasonal basis. For purposes of identifying the median employee, we converted amounts paid in foreign currencies to United States Dollars based on the applicable 2017 average exchange rates as of December 18, 2017. Although we concluded there were no changes to our employee population or employee compensation arrangements that would significantly impact our pay ratio disclosure, the median employee for purposes of the pay ratio presented here is different than the median employee identified in the proxy statement for our 2018 Annual Meeting of Shareholders. The original median employee left MKS in August 2018. As permitted by the SEC rules, the median employee identified above is one whose compensation is substantially similar to the original median employee referenced in the proxy statement for our 2018 Annual Meeting of Shareholders based on the compensation measures used to select the original median employee.

Table of Contents

The pay ratio reported above is a reasonable estimate calculated in a manner consistent with SEC rules based on our internal records and the methodology described above. Because the SEC rules for identifying the median compensated employee and calculating the pay ratio based on that employee's annual total compensation allow companies to adopt a variety of methodologies, to apply certain exclusions, and to make reasonable estimates and assumptions that reflect their employee populations and compensation practices, the pay ratio reported by other companies may not be comparable to the pay ratio reported above, as other companies have different employee populations and compensation practices and may utilize different methodologies, exclusions, estimates and assumptions in calculating their own pay ratios.

Grants of Plan-Based Awards Table in Fiscal Year 2018

Name	Grant Date(1)	Estimated Future Payouts Under Non-Equity Incentive Plan Awards(2)			Estimated Future Payouts Under Equity Incentive Plan Awards(3)			All Other Stock Awards: Number of Shares of Stock	Fair Value of Awards(5)
		Threshold (\$)	Target (\$)	Maximum (\$)	Threshold (#)	Target (#)	Maximum (#)	Units (#)	
Gerald G. Colella	N/A	\$ 600,000	\$ 1,200,000	\$ 2,400,000					
	2/15/2018				10,126	20,252	30,378	15,750	\$ 4,000,000
John T. C. Lee	N/A	\$ 253,124	\$ 506,248	\$ 1,012,496					
	2/15/2018				2,925	5,850	8,775	5,850	\$ 1,300,000
	5/09/2018				385	771	1,157	771	\$ 175,000
Seth H. Bagshaw	N/A	\$ 204,000	\$ 408,000	\$ 816,000					
	2/15/2018				3,375	6,750	10,126	5,850	\$ 1,400,000
John R. Abrams	N/A	\$ 157,600	\$ 315,200	\$ 630,400					
	2/15/2018				1,575	3,150	4,725	3,150	\$ 700,000
Dennis L. Werth	N/A	\$ 172,125	\$ 344,250	\$ 688,500					
	2/15/2018				1,575	3,150	4,725	3,150	\$ 700,000

(1) This column shows the date of grant for all equity awards granted in 2018.

(2) Represents aggregate threshold, target and maximum payout levels under the annual cash incentive plan. The actual amount of annual cash incentive compensation earned by each Named Executive Officer in 2018 is reported under the Non-Equity Incentive Plan Compensation column in the Summary Compensation Table for 2018. See Footnote 3 to the Summary Compensation Table for 2018 for details on the terms of the annual cash incentive plan.

- (3) Except as otherwise noted, these RSUs vest in equal annual installments over three years beginning in February 2019, subject to achievement of performance criteria established in 2018.
- (4) These RSUs vest in equal annual installments over three years beginning in February 2019.
- (5) Reflects the combined grant date fair value of performance-based RSUs at the target achievement level and time-based RSUs. The fair value was \$111.10 per share for RSUs awarded on February 15, 2018 and \$113.40 per share for RSUs awarded on May 9, 2018.

Table of Contents**Outstanding Equity Awards at 2018 Fiscal Year-End Table**

Name	Option Awards				Stock Awards(1)			Equity Incentive
	Number of Securities Underlying Unexercised Options (#)		Option Exercise Price (\$)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested(2) (\$)	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested (#)	Equity Incentive Plan Awards: Market Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested(2) (\$)
Gerald G. Colella					26,691(3)	\$ 1,724,521	30,378(5)	\$1,962,725
					32,645(4)	\$ 2,109,195		
					15,751(5)	\$ 1,017,709		
John T.C. Lee					9,232(3)	\$ 596,490	8,775(5)	\$ 567,009
					10,883(4)	\$ 703,151	1,157(6)	\$ 74,780
					5,850(5)	\$ 378,006		
					771(6)	\$ 49,853		
Beth H. Magshaw					11,429(3)	\$ 738,465	10,126(5)	\$ 654,242
					13,058(4)	\$ 843,704		
					5,850(5)	\$ 378,006		
John R. Abrams					4,616(3)	\$ 298,292	4,725(5)	\$ 305,313
					6,529(4)	\$ 421,852		
					3,150(5)	\$ 203,542		
Dennis L. Werth	10,313	-	\$22.39	05/20/20	7,902(4)	\$ 510,574	4,725(5)	\$ 305,313
	8,858	-	\$29.80	05/19/21	3,150(5)	\$ 203,542		
	7,366	-	\$31.13	05/19/22	4,047(7)	\$ 261,481		
					8,595(8)	\$ 555,379		

- (1) All stock awards in the above table are RSUs. Except as otherwise noted below, all RSUs vest in three equal annual installments. The annual vesting date is February 15th or the next business day if February 15th is not a business day. RSUs listed in the Equity Incentive Plan Awards column were also subject to the achievement of performance criteria.

- (2) The values were calculated based on the closing price of our Common Stock on December 31, 2018 of \$64.61 per share.
- (3) Grant date is February 16, 2016.
- (4) Grant date is February 15, 2017.
- (5) Grant date is February 15, 2018.
- (6) Grant date is May 9, 2018.
- (7) Grant date is May 31, 2016.
- (8) Grant date is May 31, 2016. The remaining RSUs vested on February 15, 2019.

Option Exercises and Stock Vested in Fiscal Year 2018 Table

Name	Stock Awards	
	Number of Shares Acquired on Vesting (#)(1)	Value Realized on Vesting \$(2)
Gerald G. Colella	64,682	\$ 7,186,180
John T.C. Lee	21,525	\$ 2,391,459
Seth H. Bagshaw	26,973	\$ 2,996,772
John R. Abrams	11,043	\$ 1,226,988
Dennis L. Werth	15,609	\$ 1,733,178

- (1) Reflects the number of shares vested before the surrender of shares in satisfaction of tax withholding obligations.
- (2) Reflects the value realized before satisfaction of tax withholding obligations.
- (3) There were no option exercises in 2018.

Table of Contents**Retirement and Post-Employment Tables*****Pension Benefits***

Pursuant to an employment agreement, we provide supplemental retirement benefits to Mr. Colella or, in the event of Mr. Colella's death, to his spouse. These supplemental retirement benefits are designed to reward Mr. Colella's long-term service with us and to serve as a significant incentive for Mr. Colella to remain with us. In addition, these benefits are designed to provide for supplemental retirement benefits that are not available under our Company-wide employee benefits due to regulatory limitations on benefit accruals.

The benefits vest upon (a) Mr. Colella reaching both (i) specified ages, and (ii) 25 years of service with us, in each case while employed with us, or (b) Mr. Colella's earlier death, disability, termination without cause (as defined in his employment agreement) or a qualifying termination in connection with a change-in-control (as defined in his employment agreement), and are forfeited in the event of termination for cause. When vested, the benefits provide for a lump sum payment of an aggregate amount calculated in accordance with actuarial tables, payable not sooner than six months after the date of termination (except in the case of death or disability). The actuarial calculations include assumptions for decreased benefit continuation for Mr. Colella's surviving spouse in the event of Mr. Colella's death. The supplemental retirement benefits are not subject to any deduction for social security or other offset amounts. The benefit amount is based upon the final average compensation, which is equal to the average of Mr. Colella's three highest years of compensation (salary plus bonus) during the 10 years prior to Mr. Colella's year of retirement (or other qualifying termination). The benefits for Mr. Colella are currently vested at 100%.

The table below sets forth the present value as of December 31, 2018 of the accumulated benefits under Mr. Colella's supplemental pension arrangement. None of our other Named Executive Officers are eligible for supplemental retirement benefits.

Name	Plan Name	Number of Years Credited Service (#)(1)	Present Value of Accumulated Benefit (\$)(2)	Payments During the Last Fiscal Year (\$)
Gerald G. Colella	Supplemental Retirement Benefits under Employment Agreement	25	\$18,160,683	-
Seth H. Bagshaw	N/A	N/A	N/A	N/A
John R. Abrams	N/A	N/A	N/A	N/A
John T.C. Lee	N/A	N/A	N/A	N/A
Dennis L. Werth	N/A	N/A	N/A	N/A

(1) Maximum number of years credited is 25.

- (2) Present value of accumulated benefit is calculated using the same assumptions we used for financial reporting purposes. The calculations use a discount rate of 3.25%, a maturity value rate of 2.61% and salary increases of 5.0% per annum and the mortality table described in IRS Notice 2008-85 for the valuation year. This is the same mortality table that is specified in Internal Revenue Code Section 417(e)(3) for minimum lump sum payments for qualified pension plans. Mr. Colella was vested in 100% of the amount set forth above as of December 31, 2018.

Non-Qualified Deferred Compensation

The table below sets forth certain information relating to Mr. Werth's participation in Newport's Deferred Compensation Plan during the year ended December 31, 2018, including (i) the aggregate dollar amounts of interest and other earnings accrued on Mr. Werth's account and (ii) the total balance of Mr. Werth's account as

Table of Contents

of December 31, 2018. In 2018, Mr. Werth contributed \$603,039 to the Deferred Compensation Plan, which represented his 2017 annual incentive compensation earned in 2017 and paid in 2018, net of applicable taxes. He did not make any withdrawals or receive distributions from, the Deferred Compensation Plan, and we did not make any contributions to the plan on behalf of Mr. Werth. We assumed this plan in connection with the Newport acquisition. No other Named Executive Officer is eligible to participate in this plan. In 2016, Newport employees, including Mr. Werth, who were eligible to participate in the plan were not permitted to make an election for the deferral of any of their salaries in 2017 but these employees, including Mr. Werth, did have the opportunity to make an election to defer their 2017 annual incentive compensation to the extent earned and paid in 2018, which, as discussed above, Mr. Werth elected to do. No further elections are permitted under this plan.

Name	Executive Contributions in Last Year (\$)	Registrant s Contributions in Last Year (\$)	Aggregate Earnings in Last Year(1) (\$)	Aggregate Withdrawals/ Distributions (\$)	Aggregate Balance at Last Year End(2) (\$)
Dennis L. Werth	-	-	\$38,897	-	\$ 940,945

(1) The aggregate earnings in 2018 consisted of market-based earnings on all compensation deferred under the plan based on the performance of the measurement funds selected by Mr. Werth. Mr. Werth did not receive any above-market or preferential earnings on amounts deferred under Newport s Deferred Compensation Plan and, accordingly, no such amounts have been reported in the Summary Compensation Table included in this proxy statement.

(2) The aggregate balance of Mr. Werth s account as of December 31, 2018 consists of amounts contributed to the plan in the form of deferrals of salary, bonus and/or non-equity incentive compensation.

Potential Payments Upon Termination or Change-in-Control

This section, including the tables below, summarizes the estimated payments and other benefits that each Named Executive Officer would be eligible to receive if his employment had terminated on December 31, 2018, under the circumstances set forth below.

Mr. Colella

In connection with Mr. Colella s initial appointment as Chief Executive Officer, we entered into an employment agreement with him, effective as of January 1, 2014. This employment agreement was subsequently amended on March 27, 2018 and October 29, 2018. The employment agreement, as amended, is referred to as the Employment Agreement and the material terms of this agreement are summarized below.

In addition to his base salary, Mr. Colella is eligible to participate in the Company s annual cash incentive compensation program, with a targeted goal of 120% of base salary subject to meeting performance goals to be

determined by our Compensation Committee, and long-term equity incentive plan, subject to meeting vesting and/or performance goals to be determined by our Compensation Committee. Mr. Colella's employment term is month-to-month, with termination upon 30 days' notice by either party, or upon death, disability, or at the Company's election if Mr. Colella fails to perform his duties or commits any other act constituting cause (as defined below).

In the event Mr. Colella's employment is terminated by the Company without cause, he is entitled to the following: (i) continuation of base salary for a period of 18 months, (ii) 1.5 times his target annual cash incentive plan bonus, (iii) payment of any annual cash incentive plan bonus earned for the prior calendar year but not yet paid, (iv) payment for continuation of medical, dental or vision insurance for 18 months and (v) reimbursement for premiums he pays (if any) for continuation of life insurance for 12 months if he elects the Company's group life insurance conversion feature. Payment of such benefits is conditioned upon execution of a release by Mr. Colella and his full compliance with the restrictive covenants described below.

Table of Contents

In the event Mr. Colella's employment is terminated due to death or total disability, or Mr. Colella voluntarily terminates his employment (other than for good reason as defined below within two years of a change-in-control (as defined in his Employment Agreement)), we will pay his base salary accrued through the last date of employment, plus any annual cash incentive plan bonus earned for the prior calendar year, but not yet paid.

In the event Mr. Colella's employment is terminated without cause or is terminated by Mr. Colella for good reason, in either case upon or at any time within two years following a change-in-control, Mr. Colella will receive a lump sum payment equal to 36 months of his base salary and three times his target annual bonus amount, payment of any annual cash incentive plan bonus earned for the prior calendar year, but not yet paid, and continued participation in the Company's medical, dental, vision and life insurance plans for 36 months. In the event such payments are determined to be subject to an excise tax imposed by Section 4999 of the Internal Revenue Code, such payments will be payable in full or, if applicable, reduced so that no portion of the payments is subject to the excise tax, whichever of the foregoing amounts results in receipt by Mr. Colella on an after-tax basis of the greater amount, taking into account all applicable taxes, including the penalty tax. Mr. Colella is not entitled to any gross-up payment for any such excise tax due on such payments.

The Employment Agreement requires Mr. Colella to return all or a portion of any incentive pay, and any severance payments computed by reference thereto, for the performance period(s) in which his termination of employment occurs and any performance period ending within the 36 month period prior to his termination of employment, if it is later determined that these awards were calculated on the basis of inaccurate information that results in a restatement of our financial statements, or for other required reasons.

The Employment Agreement provides that Mr. Colella may not, during the term of his employment and for a period of one year after termination of employment (or two years in the event Mr. Colella terminates his employment other than for good reason), (i) engage in any competitive business or activity, (ii) work for any person who was our executive, officer or agent, or establish any business or partnership with such person that is competitive to the Company, (iii) give, sell or lease any competitive services or goods to any of our customers, or (iv) have any material financial interest in or be a director, officer, partner, executive or consultant to, or exceed specified shareholding limitations in, any of the Company's competitors.

Mr. Colella is also subject to non-solicitation restrictions. During the term of his employment and for a period of two years after termination, Mr. Colella may not solicit any customer to become a customer, distributor or supplier of any other person or entity or to cease doing business with the Company; or solicit or hire any of our executives, officers or agents to terminate such person's employment or engagement with the Company or to work for a third party.

In addition, the Employment Agreement continues to provide Mr. Colella with the same supplemental retirement benefits he was entitled to before his appointment as Chief Executive Officer. The benefits vest (a) upon Mr. Colella reaching both (i) specified ages, and (ii) 25 years of service with the Company, in each case while employed by the Company, or (b) upon his earlier death, disability, termination without cause (cause is defined as a conviction for the commission of a felony, material breach of any employment or other agreements between the executive and the Company, or willful failure by the executive to perform his material responsibilities to the Company) or a qualifying termination for good reason within three years of a change-in-control (as defined in the agreement), and are forfeited in the event of termination prior to vesting as described above, termination for cause or upon violation of the noncompetition, nondisclosure, or nonsolicitation provisions contained in the Employment Agreement. When vested, subject to his execution of and compliance with a customary release, the supplemental retirement benefit provides for a lump sum payment to Mr. Colella (or in the event of his death, his spouse) of an aggregate amount calculated based upon actuarial assumptions, payable not sooner than six months after the date of termination (except in the case of death). The benefit amount is determined based upon the actuarial equivalent value of an annuity equal to 50% of

Mr. Colella's final average compensation, which is equal to the average of his three highest years of compensation (salary plus bonus) during the 10 calendar years prior to the year of retirement (or other qualifying termination). The actuarial calculations include assumptions for decreased benefit continuation (determined as a 50% survivor annuity) for

Table of Contents

Mr. Colella's surviving spouse in the event of Mr. Colella's death. As of December 31, 2018, Mr. Colella was fully vested. In the event that any payment under the supplemental retirement benefit would subject Mr. Colella to any excise tax, interest or penalties imposed under Internal Revenue Code Section 4999, we have agreed to make Mr. Colella gross-up payments for such amounts.

In addition, subject to his execution of and compliance with a customary release, Mr. Colella will receive retiree medical benefits for life, in the event he (i) retires by at least age 62, (ii) is terminated without cause or terminates his employment for good reason, in each case within three years after a change-in-control, or (iii) terminates employment due to death or disability. Mr. Colella (or his surviving spouse) would pay an annual contribution of \$1,500, and, in the event of his retirement before age 65, would pay a decreasing percentage of the costs of the benefit (from 30% to 10%) until he reaches age 65. The retiree medical benefit is coordinated with any continuation of medical benefits described above to avoid duplication of benefits.

Mr. Colella's RSU agreements provide for the full acceleration of vesting of all shares (or, in the case of performance-based RSUs that are still subject to performance criteria, the target number of RSUs) if he is terminated without cause or resigns with good reason within two years following a change-in-control (as defined in the applicable agreements), and also provides for the full acceleration of vesting of all shares (or, in the case of performance-based RSUs that are still subject to performance criteria, the actual number of RSUs to vest based upon satisfaction of performance criteria) upon retirement, death or disability.

For purposes of the foregoing description of Mr. Colella's benefits under his Employment Agreement, *cause* means that he has refused to perform the services required of him under his employment agreement or has failed or refused to comply with any of the covenants in the employment agreement, or any of the following: (i) willful or gross neglect of his duties, (ii) material breach of his employment agreement or of any of the rules, regulations, policies or procedures of the Company, or material violation of the Company's code of conduct, (iii) commission of a felony or other act of material dishonesty, including but not limited to fraud, embezzlement, misappropriation of Company property, moral turpitude, or breach of fiduciary duty that could possibly have a material adverse effect on the Company, (iv) unlawful use of controlled substances on the Company's premises or while performing his duties and responsibilities or indictment related to the commission of any criminal act, (v) failure or refusal to reasonably cooperate with any Company investigation or government/regulatory authority having jurisdiction over the executive and the Company, or (vi) engaging in willful or gross misconduct which is materially injurious to the Company, financially or otherwise, or the Company's reputation.

Under Mr. Colella's RSU agreements, *cause* means conviction for the commission of a felony, willful failure by the executive to perform his responsibilities to the Company, or willful misconduct by the executive.

Subject to compliance with certain procedural requirements, *good reason* under both the Employment Agreement and Mr. Colella's RSU agreements means voluntary separation from service within 90 days following (i) a material diminution in position, duties and responsibilities from those described in the executive's employment agreement, (ii) a reduction in the executive's base salary (other than as part of a general salary reduction program affecting senior executives), (iii) a material reduction in the aggregate value of the executive's pension and welfare benefits from those in effect prior to the change-in-control (other than as proportionate to the reductions applicable to other senior executives pursuant to a cost-saving plan that includes all senior executives), (iv) a material breach of any provision of the employment agreement by the Company, or (v) the Company's requiring the executive to be based at a location causing a one way commute in excess of 60 miles from the executive's primary residence.

Table of Contents**Potential Payments Upon Termination or Change-in-Control Table Gerald G. Colella**

The following table sets forth the estimated benefits that Mr. Colella would have been entitled to receive upon termination of his employment effective December 31, 2018:

Termination Description	Cash Severance		Value of Accelerated Unvested Equity	Benefits Continuation	Acceleration of Pension Benefits(1)	Gross up of I.R.C. Golden Parachute Excise Tax Resulting from Change-in- Control(2)	
	Base Salary	Bonus					
Termination Without Cause	\$1,500,000	\$1,800,000	N/A	\$44,218(3)	\$19,223,275	N/A	\$22,000,000
Termination	N/A	N/A	\$6,159,909(4)	\$563,591(5)	\$19,223,275	N/A	\$25,000,000
Termination	N/A	N/A	\$6,159,909(4)	\$271,356(5)	\$9,611,638	N/A	\$16,000,000
Termination	N/A	N/A	\$6,159,909(4)	\$563,591(5)	\$19,223,275	N/A	\$25,000,000
Termination Within 24 Months Following a Change-in-Control:							
Termination by the Company Without Cause	\$3,000,000	\$3,600,000	\$6,159,909(6)	\$583,391(7)	\$19,223,275	-	\$32,000,000
Termination by the Company Without Cause	\$3,000,000	\$3,600,000	\$6,159,909(6)	\$583,391(7)	\$19,223,275	-	\$32,000,000
Termination Within 24 Months and 36 Months Following a Change-in-Control:							
Termination by the Company Without Cause	\$1,500,000	\$1,800,000	N/A	\$570,191(8)	\$19,223,275	-	\$23,000,000
Termination by the Company Without Cause	N/A	N/A	N/A	\$563,591(5)	\$19,223,275	-	\$19,000,000

- (1) This amount represents the present value of the accelerated amount of the accumulated benefit under the Supplemental Retirement Benefits. See also the description under Pension Benefits above.
- (2) For purposes of assessing whether Mr. Colella would be liable for an excise tax under Section 4999 of the Internal Revenue Code on parachute payments (and in turn entitled to a gross-up payment), the calculations assume that if Mr. Colella was terminated within 24 months following a change-in-control, the vesting of the target number of his unvested performance-based RSUs and all of his unvested time-based RSUs would be accelerated. Upon a change-in-control, we agreed to reimburse Mr. Colella for excise taxes under Section 4999 solely with respect to his pension benefits.
- (3) Reflects our cost for continuation of life insurance for 12 months and continuation of medical, dental and vision coverage for 18 months following involuntary without cause termination, assuming the termination occurred on December 31, 2018.

- (4) Upon retirement (as defined in the RSU agreements), death or disability, RSUs fully vest, subject to achievement of any remaining performance criteria. The stated value assumes the retirement, death or disability occurred on December 31, 2018 and assumes the target number of unvested performance-based RSUs vested.
- (5) This amount represents the estimated present value of retiree health benefits, in each case assuming the termination occurred on December 31, 2018.
- (6) The unvested time-based RSUs fully vest and the target number of unvested performance-based RSUs vest.
- (7) This amount represents the estimated present value of retiree health benefits, \$563,591, plus our cost for continuation of life insurance for 36 months following termination of employment, \$19,800, assuming the termination occurred on December 31, 2018.
- (8) This amount represents the estimated present value of retiree health benefits, \$563,591, plus our cost for continuation of life insurance for 12 months following termination of employment, \$6,600, assuming the termination occurred on December 31, 2018.

Table of Contents***Other Named Executive Officers***

Following our acquisition of Newport in April 2016, we entered into new employment agreements with Dr. Lee and Messrs. Bagshaw, Abrams and Werth, each dated as of August 1, 2016. In connection with Dr. Lee's promotion to President of the Company, effective May 9, 2018, the Company entered into a new employment agreement with Dr. Lee that superseded and replaced his August 1, 2016 employment agreement. On October 29, 2018, the Company entered into an amendment to the employment agreements with Dr. Lee and Mr. Bagshaw.

Below is a summary of the material terms of the employment agreements for Dr. Lee and Messrs. Bagshaw and Werth. Mr. Abrams retired from the Company on February 28, 2019. In advance of his retirement, Mr. Abrams entered into a Transition and Retirement Agreement with the Company on May 9, 2018, which superseded and replaced the employment agreement he entered into on August 1, 2016. Pursuant to the terms of his Transition and Retirement Agreement, the Company paid Mr. Abrams \$830,000 shortly after his retirement date upon the execution and effectiveness of a customary release and Mr. Abrams remains subject to confidentiality, non-solicitation and non-competition provisions, the material terms of which are the same as discussed below for Dr. Lee and Mr. Bagshaw.

Under the employment agreements with Dr. Lee and Messrs. Bagshaw and Werth, in addition to their base salaries, the executives are eligible to participate in the Company's annual cash incentive compensation program. These employment agreements provide for terms that are at-will, with termination upon death, disability, or at our election if the executive fails to perform his duties or commits any other act constituting cause (as defined below). In the event that the executive resigns from the Company or is terminated by the Company without cause, subject to certain procedural requirements, the Company will pay such executive his base salary for a period of at least 30 days after the notice of such termination or resignation is delivered. In addition to the benefits described in the previous sentence, in the case of Mr. Werth, the Company has agreed to reimburse him for any premiums he pays during the 30 days following the notice of his resignation or termination for continuation of life insurance, should he elect to exercise the conversion feature, if any, of the Company's group life policy then in effect and for the premiums, if any, for such medical/dental insurance as Mr. Werth may then receive should he elect continuation under the federal COBRA program. In the event that we terminate Dr. Lee's or Mr. Bagshaw's employment without cause, each executive is entitled to a lump sum payment equal to 12 months base salary and to the extent that such executive elects to continue coverage, payment by the Company of premiums for medical, vision and dental insurance coverage under COBRA for a period of 12 months less the premium contribution paid by similarly-situated employees. In the event we terminate Mr. Werth's employment without cause, he is entitled to a lump sum payment equal to the greater of: (i) six months of his base salary, or (ii) two weeks of his base salary for each year of his prior service to the Company. If Mr. Werth's employment is terminated without cause, his one-time special RSU award that he received in connection with the Newport acquisition to compensate him for forfeiting certain rights to certain severance payments and benefits that he was entitled to under his Newport severance agreement, which we refer to as his Waiver Award, will become vested in full (if not already fully vested) as of the effective date of such termination.

In the event that Dr. Lee or Messrs. Bagshaw or Werth's employment is terminated without cause, or is terminated by the executive for good reason (as defined below) within 24 months after a change-in-control (as defined in the applicable agreement), each executive is entitled to: (i) a lump sum payment equal to one and one-half times his annual base salary, or two times his annual base salary in the case of Mr. Bagshaw, (ii) a lump sum payment equal to one and one-half times the annual amount of his target incentive compensation for which such executive is eligible, or two times the annual amount of his target incentive compensation in the case of Mr. Bagshaw, (iii) a prorated portion of the then current year's target bonus amount, and (iv) to the extent that such executive elects to continue coverage, payment by the Company of its usual share of premiums for medical, vision and dental insurance coverage under COBRA for a period of 18 months, or 24 months in the case of Mr. Bagshaw, following termination. In addition,

Mr. Werth's Waiver Award will become vested in full (if not already fully vested) as of the effective date of such termination. In the event such payments are determined to be subject to an excise tax imposed by Section 4999 of the Internal Revenue Code, such payments will be payable in full or, if applicable, reduced so that no portion of the payments is subject to the excise tax, whichever of the

Table of Contents

foregoing amounts results in receipt by Dr. Lee and Messrs. Bagshaw and Werth, as the case may be, on an after-tax basis of the greater amount, taking into account all applicable taxes, including the penalty tax. Dr. Lee and Messrs. Bagshaw and Werth are not entitled to any gross-up payment for any such excise tax due.

The employment agreements of Dr. Lee and Mr. Bagshaw contain non-competition provisions that provide that each executive may not, during the term of his employment and for one year after termination of employment, engage in any competitive business or activity. In addition, each of Dr. Lee and Mr. Bagshaw may not, during the term of employment and for one year after the termination of employment: (i) solicit, hire or otherwise induce any Company employee to terminate his or her employment with the Company, (ii) solicit or hire any of our suppliers, joint ventures, research partners or customers for the purpose of competing with the Company, (iii) encourage any of such persons or entities not to enter into a business relationship with MKS or interfere with the relationship between the Company and such persons or entities, or (iv) sell to any of the Company's customers any products of the types sold by the Company with respect to which products the executive officer had material dealings in the performance of his duties within the period two years prior to his termination. Mr. Werth is subject to a non-solicitation agreement; however, because Mr. Werth is based in California, he is only subject to the restrictions set forth in Section (i) above (excluding the prohibition against hiring) as the other restrictions are not enforceable under California law.

The RSU agreements for each of Dr. Lee and Mr. Bagshaw, and the RSU agreements evidencing 2017 and 2018 grants to Mr. Werth, or the 2017 and 2018 RSU Agreements, provide for full acceleration of vesting of all RSUs (or, in the case of performance-based RSUs that are still subject to performance criteria, the target number of RSUs) if such executive is terminated without cause or resigns with good reason within 24 months following a change-in-control (as defined in the applicable agreements). The RSU agreements for each of Dr. Lee and Mr. Bagshaw, and the 2017 and 2018 RSU Agreements for Mr. Werth also provide for full acceleration of vesting of all shares (or, in the case of performance-based RSUs that are still subject to performance criteria, the actual number of RSUs to vest based upon satisfaction of performance criteria) upon retirement, death or disability. Retirement, in this context, means a voluntary termination of employment by the executive after he is at least age 60 and has at least 10 years of service with us. RSUs granted to executives typically vest in three equal annual installments, and typically at least half of the target annual equity grant value is subject to performance criteria. The employment agreement for Mr. Werth provides for full acceleration of vesting of his Waiver Award if he is terminated without cause or resigns with good reason within 24 months following a change-in-control (as such terms are defined in his employment agreement). The RSU agreements evidencing 2016 grants to Mr. Werth, or the 2016 RSU Agreements, including his Waiver Award, provide for full acceleration of vesting of all shares (or, in the case of performance-based RSUs that are still subject to performance criteria, the actual number of RSUs to vest based upon satisfaction of performance criteria) upon death or disability.

For purposes of the foregoing description of benefits under the employment agreements with Dr. Lee and Messrs. Bagshaw and Werth, "cause" will exist if the executive: (i) commits a felony or engages in fraud, misappropriation or embezzlement, (ii) knowingly fails or refuses to perform such executive's duties in a material way and, to the extent that the Company determines such failure or refusal can reasonably be cured, fails or refuses to effect a cure within 10 days after the Company notifies such executive in writing of the failure or refusal, (iii) knowingly causes, or knowingly creates a serious risk of causing, material harm to the Company's business or reputation, or (iv) breaches, in a material way, such executive's employment agreement, the confidential information agreement or any other agreement between such executive and the Company, and, to the extent that the Company determines such breach can reasonably be cured, fails or refuses to effect a cure within 10 days after the Company notifies such executive in writing of the breach.

For purposes of the foregoing description of benefits under the employment agreements with Dr. Lee and Messrs. Bagshaw and Werth, subject to compliance with certain procedural requirements, "good reason" for the applicable

executive to resign will exist if, without such executive's express written consent: (i) the Company materially reduces such executive's position, duties or responsibilities, (ii) the Company reduces such executive's base salary as in effect on the date hereof or as the same may be increased from time to time during

Table of Contents

the term of the applicable employment agreement, or (iii) the Company changes such executive's principal place of work to a location more than 50 miles from such executive's current principal place of work.

Under the RSU agreements for Dr. Lee and Mr. Bagshaw, and the 2017 and 2018 RSU Agreements for Mr. Werth, cause and good reason are the same as defined under Mr. Colella's RSU agreements.

Mr. Werth transitioned to the role of advisor effective January 2, 2019 and will retire on July 5, 2019. He will be entitled to payment by the Company of its usual share of premiums for medical, vision and dental insurance coverage under COBRA for a period of 12 months following his retirement.

Potential Payments Upon Termination or Change-in-Control Table – Other Named Executive Officers

The following table sets forth the estimated benefits that Dr. Lee and Messrs. Bagshaw and Werth would have been entitled to receive upon termination of his employment effective December 31, 2018 and the actual benefits Mr. Abrams received upon his retirement on February 28, 2019:

Termination Circumstance	Cash Severance		Value of Accelerated Unvested Equity	Benefits Continuation	Total
	Base Salary	Bonus			
Involuntary Without Cause Termination:					
John T. C. Lee	\$ 545,000	-	-	\$ 36,700	\$ 581,700
Seth H. Bagshaw	\$ 510,000	-	-	\$ 31,369	\$ 541,369
Dennis L. Werth	\$ 262,500	-	\$ 437,122(1)	\$ 2,895(2)	\$ 702,517
Within 24 Months Following a Change-in-Control:					
John T. C. Lee	\$ 817,500	\$ 776,625	\$ 2,155,360(3)	\$ 56,085(4)	\$ 3,805,570
Seth H. Bagshaw	\$ 1,020,000	\$ 816,000	\$ 2,396,336(3)	\$ 64,117(4)	\$ 4,296,453
Dennis L. Werth	\$ 675,000	\$ 506,250	\$ 1,354,780(3)	\$ 49,163(4)	\$ 2,585,193
Death or Disability:					
John T. C. Lee	-	-	\$ 2,155,360(5)	-	\$ 2,155,360
Seth H. Bagshaw	-	-	\$ 2,396,336(5)	-	\$ 2,396,336
Dennis L. Werth	-	-	\$ 1,734,518(5)	-	\$ 1,734,518
Retirement:					
John T. C. Lee	-	-	-(6)	-	-
Seth H. Bagshaw	-	-	-(6)	-	-
John R. Abrams	\$ 830,000(7)	-	-(6)	-	\$ 830,000
Dennis L. Werth	-	-	\$ 917,658(6)	\$ 34,740(8)	\$ 952,398

(1) The unvested time-based RSUs subject to Mr. Werth's Waiver Award fully vest.

(2) Assumes Mr. Werth elects the conversion feature of the Company's group life insurance policy in effect as of December 31, 2018 and continuation under the federal COBRA program, and reflects reimbursement of any

premiums for continuation of life insurance and for medical/dental insurance paid during the 30 days following the notice of his resignation or termination.

- (3) In the case of Dr. Lee and Mr. Bagshaw, the unvested time-based RSUs fully vest and the target number of unvested performance-based RSUs vest. In the case of Mr. Werth, the unvested time-based RSUs fully vest and the target number of unvested performance-based RSUs awarded in 2017 and 2018 vest as well as the unvested time-based RSUs subject to Mr. Werth's Waiver Award.
- (4) Reflects our cost for continuation of life insurance, medical, dental and vision coverage for 18 months (or 24 months in the case of Mr. Bagshaw) following involuntary without cause termination within 24 months following a change-in-control, assuming the termination occurred on December 31, 2018.
- (5) Upon death or disability, RSUs for Dr. Lee and Messrs. Bagshaw and Werth fully vest, subject to achievement of any remaining performance criteria. The stated value assumes the death or disability occurred on December 31, 2018 and assumes the target number of unvested performance-based RSUs vested.

Table of Contents

- (6) Upon retirement (as defined in the RSU agreements), RSUs for Dr. Lee and Mr. Bagshaw, and RSUs for Mr. Werth awarded in 2017 and 2018, fully vest, subject to achievement of any remaining performance criteria. However, Dr. Lee and Mr. Bagshaw did not meet the requirements for retirement as of December 31, 2018. Mr. Werth's 2016 RSU agreements do not provide for acceleration of vesting upon retirement.

- (7) Reflects the actual payment Mr. Abrams received in connection with his retirement on February 28, 2019 pursuant to the terms of his Transition and Retirement Agreement dated May 9, 2018.

- (8) Mr. Werth is entitled to payment by the Company of its usual share of premiums for medical, vision and dental insurance coverage under COBRA for a period of 12 months following his retirement on July 5, 2019.

Table of Contents**EQUITY COMPENSATION PLAN INFORMATION**

The following table provides information about the securities authorized for issuance under our equity compensation plans as of December 31, 2018:

Plan Category	Number of securities to be issued upon exercise of outstanding options, warrants and rights(1)	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))
	(a)	(b)	(c)
Equity compensation plans approved by security holders	824,932(2)	\$ 28.52(3)	16,006,580(4)
Equity compensation plans not approved by security holders	-	-	-
Total	824,932(2)		16,006,580(4)

(1) When we acquired Newport, we assumed: (i) all restricted stock units granted under any Newport equity plan that were outstanding immediately prior to the effective time of the acquisition and as to which shares of Newport common stock were not fully distributed in connection with the closing of the acquisition and (ii) all stock appreciation rights granted under any Newport equity plan, whether vested or unvested, that were outstanding immediately prior to the effective time of the acquisition. Such restricted stock units were converted automatically into restricted stock units with respect to 360,674 shares of our Common Stock, which we refer to as the Assumed RSUs, and such stock appreciation rights were converted automatically into stock appreciation rights with respect to 899,851 shares of our Common Stock, which we refer to as the Assumed SARs. An additional 59,626 restricted stock units, which were issued under Newport's equity plans and have vested in accordance with the applicable award agreements, were deferred by the awardees under Newport's Deferred Compensation Plan at the time of vesting and were converted automatically into restricted stock units with respect to 36,599 shares of our Common Stock. As of December 31, 2018, 6,760 shares of our Common Stock were held in the Deferred Compensation Plan for the benefit of such awardees.

(2) As of December 31, 2018, the number of shares reflected in column (a) consists of: (i) Assumed SARs with respect to an aggregate of 177,538 shares of our Common Stock, (ii) Assumed RSUs with respect to 6,385 shares of our Common Stock and (iii) RSUs representing the right to receive an aggregate of 641,009 shares of our Common Stock upon vesting, all of which were issued under our 2014 Stock Incentive Plan.

(3)

The weighted average exercise price represents the base value of all outstanding Assumed SARs. All outstanding RSUs were awarded without payment of any purchase price.

- (4) This number includes 14,079,849 shares available for issuance under our 2014 Stock Incentive Plan and 1,926,731 shares reserved for issuance under our 2014 Employee Stock Purchase Plan. Shares issued under our 2014 Stock Incentive Plan in respect of RSUs, restricted stock or other stock-based awards with a per share price lower than 100% of fair market value on the date of grant count against the shares available for grant under the plan as 2.4 shares for every share granted.

Table of Contents

OTHER MATTERS

The Board of Directors does not know of any other matters which may come before the meeting. However, if any other matters are properly presented to the meeting, it is the intention of the persons named in the accompanying proxy to vote, or otherwise act, in accordance with their judgment on such matters.

Electronic Voting

If you own shares of Common Stock of record, you may vote your shares over the Internet at www.proxyvote.com or telephonically by calling 1-800-690-6903 and by following the instructions on the Notice or proxy card. Proxies submitted over the Internet or by telephone must be received by 11:59 p.m. Eastern Time on May 7, 2019.

If the shares you own are held in street name by a bank, broker or other nominee, your bank, broker or other nominee will provide a vote instruction form to you with this proxy statement, which you may use to direct how your shares will be voted. **You must instruct your bank, broker or other nominee how to vote with respect to the election of directors and the executive compensation advisory vote; your bank, broker or other nominee cannot exercise its discretion to vote on these matters on your behalf.** Many banks and brokers also offer the option of voting over the Internet or by telephone, instructions for which would be provided by your bank or broker on your vote instruction form.

We hope that shareholders will attend the Annual Meeting. Whether or not you plan to attend, we urge you to vote your shares over the Internet or by telephone, or complete, date, sign and return the proxy card in the accompanying postage-prepaid envelope if you received a printed proxy card. A prompt response will greatly facilitate arrangements for the Annual Meeting and your cooperation will be appreciated. Shareholders who attend the Annual Meeting may vote their stock personally even if they have previously sent in their proxies.

Expenses and Solicitation

All costs of solicitation of proxies will be borne by us. In addition to solicitations by mail, our directors, officers and regular employees, without additional remuneration, may solicit proxies by telephone and personal interviews and we reserve the right to retain outside agencies for the purpose of soliciting proxies. Brokers, custodians and fiduciaries will be requested to forward proxy soliciting material to the owners of stock held in their names, and we will reimburse them for their reasonable out-of-pocket expenses incurred in connection with the distribution of proxy materials.

Deadline for Submission of Shareholder Proposals for the 2020 Annual Meeting

Proposals of shareholders intended to be presented at the 2020 Annual Meeting of Shareholders must be received by us at our principal office in Andover, Massachusetts not later than November 29, 2019 for inclusion in the proxy statement for that meeting.

In addition, our Amended and Restated By-Laws (which are on file with the SEC) require that we be given advance notice of matters that shareholders wish to present for action at an Annual Meeting of Shareholders, including director nominations (other than matters included in our proxy statement in accordance with Rule 14a-8 of the Securities Exchange Act of 1934, as amended). The required written notice must be delivered to our Secretary at our principal office at least 90 days but no more than 120 days prior to the first anniversary of the preceding year's Annual Meeting or it will be considered untimely. However, in the event that the date of the Annual Meeting is advanced by more than 20 days, or delayed by more than 60 days, from the first anniversary of the preceding year's Annual Meeting, a

shareholder's notice must be received no earlier than the 120th day prior to the Annual Meeting and not later than the close of business on the later of (i) the 90th day prior to the Annual Meeting and (ii) the seventh day following the day on which notice of the date of the Annual Meeting was mailed or public disclosure of the date of the Annual Meeting was made, whichever occurs first. Assuming

Table of Contents

that the 2020 Annual Meeting is not advanced by more than 20 days or delayed by more than 60 days from the anniversary date of the 2019 Annual Meeting, shareholders will need to give us appropriate notice at the address noted above no earlier than January 9, 2020 and no later than February 8, 2020. The advance notice provisions of our Amended and Restated By-Laws contain the requirements of the written notice of shareholders and supersede the notice requirement contained in Rule 14a-4(c)(1) under the Securities Exchange Act of 1934, as amended.

By Order of the Board of Directors,

RICHARD S. CHUTE

Secretary

March 28, 2019

Table of Contents

Important Notice Regarding the Availability of Proxy Materials for the 2019 Annual Meeting: The Annual Report, Notice & Proxy Statement are available at www.proxyvote.com.

MKS INSTRUMENTS, INC.

2019 Annual Meeting of Shareholders

May 8, 2019 10:00 AM

This proxy is solicited by the Board of Directors.

The undersigned shareholder of MKS Instruments, Inc., a Massachusetts corporation (the Company), hereby acknowledges receipt of the Notice of 2019 Annual Meeting of Shareholders and Proxy Statement, each dated March 28, 2019, and hereby appoints Gerald G. Colella and Kathleen F. Burke, and each of them acting singly, proxies and attorneys-in-fact, with full power to each of substitution, on behalf and in the name of the undersigned, to represent the undersigned at the 2019 Annual Meeting of Shareholders of the Company to be held on May 8, 2019 at 10:00 AM, Eastern Time, at MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, MA 01810, and at any adjournment or postponement thereof, and to vote all shares of Common Stock which the undersigned would be entitled to vote if then and there personally present, on the matters set forth on the reverse side, and, in their discretion, upon any other matters which may properly come before the meeting.

Your Internet or telephone vote authorizes the named proxies to vote the shares in the same manner as if you marked, signed, dated and returned your proxy card. If you vote the shares over the Internet or by telephone, please do not return your proxy card.

UNLESS VOTING THE SHARES OVER THE INTERNET OR BY TELEPHONE, PLEASE DATE, SIGN AND MAIL YOUR PROXY CARD IN THE ENVELOPE PROVIDED AS SOON AS POSSIBLE.

Address change/comments:

(If you noted any address change and/or comments above, please mark corresponding box on the reverse side.)

Continued and to be signed on reverse side

Table of Contents

MKS Instruments, Inc.

2 Tech Drive

Suite 201

Andover, MA 01810

ELECTRONIC DELIVERY OF FUTURE PROXY MATERIALS

If you would like to reduce the costs incurred by our Company in mailing proxy materials, you can consent to receive all future proxy statements, proxy cards and annual reports electronically via e-mail or the Internet. To sign up for electronic delivery, please follow the instructions below to vote using the Internet and, when prompted, indicate that you agree to receive or access proxy materials electronically in future years.

VOTE BY INTERNET www.proxyvote.com

Use the Internet to transmit your voting instructions and for electronic delivery of information up until 11:59 P.M. Eastern Time on May 7, 2019. Have your proxy card in hand when you access the website and follow the instructions to obtain your records and to create an electronic voting instruction form.

VOTE BY PHONE 1-800-690-6903

Use any touch-tone telephone to transmit your voting instruction up until 11:59 P.M. Eastern Time on May 7, 2019. Have your proxy card in hand when you call and then follow the instructions.

VOTE BY MAIL

Mark, sign and date your proxy card and return it in the postage-paid envelope we have provided or return it to Vote Processing, c/o Broadridge, 51 Mercedes Way, Edgewood, NY 11717.

TO VOTE, MARK BLOCKS BELOW IN BLUE OR BLACK
INK AS FOLLOWS:

KEEP THIS PORTION FOR YOUR RECORDS

DETACH AND RETURN THIS PORTION ONLY

THIS PROXY CARD IS VALID ONLY WHEN SIGNED AND DATED.

The Board of Directors recommends you vote FOR the following:

1. The election of the two nominees listed below as Class II Directors, each to serve for a three-year term:

Nominees

01 Jacqueline F. Moloney

02 Michelle M. Warner

FOR ALL

WITHHOLD ALL

FOR ALL EXCEPT

To withhold authority to vote for any individual nominee(s), mark **For All Except** and write the number(s) of the nominee(s) on the line below.

The Board of Directors recommends you vote FOR the following proposal:

2. The approval, on an advisory basis, of executive compensation.

For Against Abstain

The Board of Directors recommends you vote FOR the following proposal:

3. The ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for the year ending December 31, 2019.

For Against Abstain

This proxy, when properly executed, will be voted in the manner directed by the undersigned shareholder. If no direction is indicated, this proxy will be voted FOR the election of each of the two (2) nominees listed above as Class II Directors of the Company, FOR proposals 2 and 3, and, as said proxies deem advisable, in their discretion, on such other matters as may properly come before the meeting.

For address change/comments, mark here:

(see reverse for instructions)

Please indicate if you plan to attend this meeting: **Yes** **No**

Please sign exactly as your name(s) appear(s) on this card. When signing as attorney, executor, administrator, or other fiduciary, please give your full title. Joint owners should each sign personally. All holders must sign. If a corporation or partnership, please sign in full corporate or partnership name by an authorized officer.

Signature [PLEASE SIGN WITHIN
BOX] Date

Signature (Joint Owners)

Date