

**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.
- Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.

1) Title of each class of securities to which transaction applies:

2) Aggregate number of securities to which transaction applies:

3) Per unit price or other underlying value of transaction computed pursuant to Exchange Act Rule 0-11 (set forth the amount on which the filing fee is calculated and state how it was determined):

4) Proposed maximum aggregate value of transaction:

5) Total fee paid:

Fee paid previously with preliminary materials.

Check box if any part of the fee is offset as provided by Exchange Act Rule 0-11(a)(2) and identify the filing for which the offsetting fee was paid previously. Identify the previous filing by registration statement number, or the Form or Schedule and the date of its filing.

1) Amount Previously Paid:

2) Form, Schedule or Registration Statement No.:

3) Filing Party:

4) Date Filed:



**MKS INSTRUMENTS, INC.
2 TECH DRIVE, SUITE 201
ANDOVER, MASSACHUSETTS 01810**

March 24, 2017

Dear Shareholder:

You are cordially invited to attend the 2017 Annual Meeting of Shareholders of MKS Instruments, Inc. to be held on Wednesday, May 10, 2017 at 10:00 a.m., local time, at MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810.

The enclosed 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 three Class III Directors, each for a three-year term, (ii) the approval, on an advisory basis, of executive compensation, (iii) an advisory vote regarding the frequency of advisory votes on executive compensation and (iv) the ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for the year ending December 31, 2017.

Whether or not you plan to attend the Annual Meeting, please complete, date, sign and return your Proxy Card promptly in the enclosed envelope, which requires no postage if mailed in the United States. If you attend the Annual Meeting, you may vote in person if you wish, even if you have previously returned your Proxy Card, 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 and President



**MKS INSTRUMENTS, INC.
2 TECH DRIVE, SUITE 201
ANDOVER, MASSACHUSETTS 01810**

**NOTICE OF 2017 ANNUAL MEETING OF SHAREHOLDERS
TO BE HELD ON MAY 10, 2017**

To our Shareholders:

NOTICE IS HEREBY GIVEN that the 2017 Annual Meeting of Shareholders of MKS INSTRUMENTS, INC., a Massachusetts corporation, will be held on Wednesday, May 10, 2017 at 10:00 a.m., local time, at MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810. At the meeting, shareholders will consider and vote on the following matters:

1. The election of three Class III Directors, each for a three-year term;
2. The approval, on an advisory basis, of executive compensation;
3. An advisory vote regarding the frequency of advisory votes on executive compensation; and
4. The ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for the year ending December 31, 2017.

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

The Board of Directors has fixed the close of business on March 8, 2017 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. Our stock transfer books will remain open for the purchase and sale of our Common Stock.

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 24, 2017

IMPORTANT

WHETHER OR NOT YOU EXPECT TO ATTEND THE ANNUAL MEETING IN PERSON, PLEASE PROMPTLY SIGN, DATE AND RETURN THE ENCLOSED PROXY. PROMPTLY SIGNING, DATING AND RETURNING THE PROXY WILL SAVE US THE EXPENSE AND EXTRA WORK OF ADDITIONAL SOLICITATION. AN ADDRESSED ENVELOPE FOR WHICH NO POSTAGE IS REQUIRED IF MAILED IN THE UNITED STATES IS ENCLOSED FOR THAT PURPOSE. SENDING IN YOUR PROXY WILL NOT PREVENT YOU FROM VOTING YOUR STOCK AT THE ANNUAL MEETING IF YOU DESIRE TO DO SO, AS YOUR PROXY IS REVOCABLE AT YOUR OPTION.

**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 2017 Annual Meeting of Shareholders to be held on May 10, 2017 at 10:00 a.m., local time, at MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810, and at any adjournment or postponement thereof (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 2017 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.

VOTING SECURITIES AND VOTES REQUIRED

At the close of business on March 8, 2017, 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 53,861,491 shares of our common stock, no par value per share (the "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.

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 (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 III 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), the advisory vote regarding the frequency of advisory votes on executive compensation (Proposal Three) and the ratification of PricewaterhouseCoopers LLP (Proposal Four) require the affirmative vote of the holders of a majority of the votes cast on the matter. Proposals Two and Three are non-binding proposals.

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, the advisory vote on executive compensation and the advisory vote regarding the frequency of the advisory votes 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 certain percentage of the shares voting 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.

**THE NOTICE OF ANNUAL MEETING, THIS PROXY STATEMENT AND OUR ANNUAL REPORT
TO SHAREHOLDERS FOR THE YEAR ENDED DECEMBER 31, 2016 ARE BEING MAILED TO
SHAREHOLDERS ON OR ABOUT MARCH 31, 2017.**

**IMPORTANT NOTICE REGARDING THE AVAILABILITY OF PROXY MATERIALS FOR THE SHAREHOLDER MEETING TO BE HELD
ON MAY 10, 2017**

A copy of (i) our Annual Report to Shareholders for the year ended December 31, 2016, which contains consolidated financial statements and other information of interest to shareholders, (ii) this Proxy Statement and this Notice, and (iii) information on how to obtain directions to be able to attend the meeting and vote in person can be accessed on our website at investor.mksinst.com/annualproxy.cfm or by calling (800) 227-8766.

A COPY OF OUR ANNUAL REPORT ON FORM 10-K FOR THE YEAR ENDED DECEMBER 31, 2016 AS FILED WITH THE SECURITIES AND EXCHANGE COMMISSION, OR 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.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth certain information with respect to the beneficial ownership of Common Stock by (i) each shareholder known to us to be the beneficial owner of more than 5% of the outstanding shares of Common Stock; (ii) the executive officers named in the Summary Compensation Table below; (iii) each of our current directors and our 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, 2017; 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.

| <u>Name of Beneficial Owners</u> | <u>Number of Shares Beneficially Owned(1)</u> | <u>Percentage of Common Stock Beneficially Owned</u> |
|--|---|--|
| <i>5% shareholders</i> | | |
| Black Rock, Inc. 40 East 522 nd Street New York, NY 10022 | 6,159,789(2) | 11.48% |
| Wellington Management Group, LLP. 280 Congress Street Boston, MA 02210 | 5,608,021(3) | 10.45% |
| The Vanguard Group, Inc. 100 Vanguard Blvd. Malvern, PA 19355 | 4,486,019(4) | 8.36% |
| Dimensional Fund Advisors LP Palisades West, Building One 6300 Bee Cave Road Austin, TX 78746 | 4,226,764(5) | 7.88% |
| <i>Named Executive Officers</i> | | |
| Gerald G. Colella | 88,194(6) | * |
| Seth H. Bagshaw | 43,898(7) | * |
| John T.C. Lee | 18,343(8) | * |
| Brian C. Quirk | 21,342(9) | * |
| Dennis L. Werth | 34,253(10) | * |
| <i>Non-Employee Directors and Director Nominee</i> | | |
| Robert R. Anderson | 13,795(11) | * |
| Gregory R. Beecher | 37,182 | * |
| John R. Bertucci | 586,045(12) | 1.09% |
| Richard S. Chute | 5,782 | * |
| Peter R. Hanley | - | - |
| Rick D. Hess | - | - |
| Jacqueline F. Moloney | - | - |
| Elizabeth A. Mora | 11,332 | * |
| Robert J. Phillippy | 14,067(13) | * |
| All directors and executive officers as a group (14 persons) | 887,222(14) | 1.65% |

* 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, 2017 subject to the vesting of restricted stock units (“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 53,672,871 shares of Common Stock outstanding as of January 1, 2017. Shares of Common Stock which an individual or entity has a right to acquire within the 60-day period following January 1, 2017 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 January 12, 2017, reporting stock ownership as of December 31, 2016. Black Rock, Inc. has sole voting power with respect to 6,044,341 shares and sole investment power with respect to 6,159,789 shares.
- (3) Based on information set forth in Schedule 13G/A filed by Wellington Management Group, LLP on February 10, 2017, reporting stock ownership as of December 31, 2016. Wellington Management Group, LLP has shared voting power with respect to 4,163,081 shares and shared investment power with respect to 5,608,021 shares.
- (4) Based on information set forth in Schedule 13G/A filed by The Vanguard Group, Inc. on February 10, 2017, reporting stock ownership as of December 31, 2016. The Vanguard Group, Inc. has sole voting power with respect to 66,070 shares, shared voting power with respect to 6,104 shares, sole investment power with respect to 4,416,474 shares and shared investment power with respect to 69,545 shares.
- (5) Based on information set forth in Schedule 13G/A filed by Dimensional Fund Advisors LP on February 9, 2017, reporting stock ownership as of December 31, 2016. Dimensional Fund Advisors LP has sole voting power with respect to 4,168,464 shares and sole investment power with respect to 4,226,764 shares. Dimensional Fund Advisors LP disclaims beneficial ownership of such securities.
- (6) Consists of 35,400 shares held directly by Mr. Colella and 52,794 shares subject to RSUs that vest within 60 days after January 1, 2017.
- (7) Consists of 19,604 shares held directly by Mr. Bagshaw and 24,494 shares subject to RSUs that vest within 60 days after January 1, 2017.
- (8) Consists of 302 shares held directly by Dr. Lee and 18,041 shares subject to RSUs that vest within 60 days after January 1, 2017.
- (9) Consists of 10,209 shares held directly by Mr. Quirk and 11,133 shares subject to RSUs that vest within 60 days after January 1, 2017.
- (10) Consists of 5,470 shares subject to RSUs that vest within 60 days of January 1, 2017 and stock-settled stock appreciation rights with respect to 28,783 shares of Common Stock that are exercisable within 60 days of January 1, 2017.
- (11) These shares are held in the name of Mr. Anderson’s trust.
- (12) Consists of 280,204 shares held directly or indirectly by Mr. Bertucci and 305,841 shares held directly or indirectly by Mr. Bertucci’s wife.
- (13) These shares are held in the name of Mr. Phillippy’s trust.
- (14) Consists of 738,666 shares held directly or indirectly by such directors and executive officers, 119,773 shares subject to RSUs that vest within 60 days of January 1, 2017 and stock-settled stock appreciation rights with respect to 28,783 shares of Common Stock that are exercisable within 60 days of January 1, 2017.

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.

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 2018 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 2017 Annual Meeting. Our Board of Directors, upon the recommendation of our Nominating and Corporate Governance Committee, has nominated John R. Bertucci, Gregory R. Beecher and Rick D. Hess to serve as Class III Directors for a term to expire at the 2020 Annual Meeting. Messrs. Bertucci and Beecher currently serve as directors. Each nominee has consented to being named herein, and, if elected, to serve as a director until his successor is duly elected and qualified. Robert R. Anderson, who currently serves as a Class III Director, is not standing for re-election to the Board of Directors.

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 any 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.

BOARD RECOMMENDATION

THE BOARD OF DIRECTORS BELIEVES THAT APPROVAL OF THE ELECTION OF JOHN R. BERTUCCI, GREGORY R. BEECHER AND RICK D. HESS TO SERVE AS CLASS III DIRECTORS IS IN THE BEST INTERESTS OF MKS AND OUR SHAREHOLDERS AND THEREFORE RECOMMENDS A VOTE "FOR" ALL NOMINEES.

DIRECTORS

The Board of Directors, upon the recommendation of the Nominating and Corporate Governance Committee, has nominated John R. Bertucci, Gregory R. Beecher and Rick D. Hess to serve as Class III 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 III Directors) and Mr. Hess, 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 director'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 director, directly or indirectly, as of January 1, 2017 appears in this proxy statement under the heading "Security Ownership of Certain Beneficial Owners and Management." Robert R. Anderson is not standing for re-election to the Board of Directors and, accordingly, his tenure as a director will end as of the date of our 2017 Annual Meeting.

| <u>Name</u> | <u>Age</u> | <u>Position</u> | <u>Class to Which Director Currently Belongs</u> |
|--------------------------|------------|---|--|
| *John R. Bertucci | 76 | Director, Chairman | III |
| Robert R. Anderson(1)(3) | 79 | Director | III |
| *Gregory R. Beecher(1) | 59 | Director | III |
| Richard S. Chute(2) | 78 | Director, Secretary | II |
| Gerald G. Colella | 60 | Director, Chief Executive Officer and President | I |
| Peter R. Hanley(2)(3) | 77 | Director | II |
| *Rick D. Hess | 63 | Director Nominee | N/A |
| Jacqueline F. Moloney(2) | 63 | Director | II |
| Elizabeth A. Mora(1)(3) | 56 | Director | I |
| Robert J. Phillippy | 56 | Director | I |

* Nominee for election at this meeting

(1) Member of Audit Committee

(2) Member of Nominating and Corporate Governance Committee

(3) Member of Compensation Committee

John R. Bertucci

Mr. Bertucci has served as our director since 1970, and 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 and served on its Audit Committee and Executive Committee from 2007 to 2016. Mr. Bertucci has served as a member of the Board of Trustees of Carnegie Mellon University since May 2002. 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.

Gregory R. Beecher

Mr. Beecher has served as our director since August 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 has served as a director and Chairman of the Audit Committee of Xyleco, Inc. a privately held company, since October 2016. Mr. Beecher served 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 the Board of Directors and the Audit Committee.

Richard S. Chute

Mr. Chute has served as our director since 1974. Mr. Chute was a member of the law firm of Hill & Barlow, a Professional Corporation, from 1971 to January 2003, with an extensive corporate practice, and is currently an attorney in private practice. From October 2004 to November 2016, Mr. Chute served as a director and Chairman of the Audit Committee of Massachusetts Audubon Society, Inc., currently serving on its Advisory Council and as a member of its Administration and Finance Committee. Mr. Chute has also served as a director and member of the Nominating and Audit Committees of Manomet, Inc., a non-profit organization, since November 1993. He has served on over 15 other non-profit and private company boards. Mr. Chute's extensive legal experience provides him with a unique perspective, which is particularly valuable in Mr. Chute's current roles as Secretary of the Company and as Chair of the Nominating and Corporate Governance Committee.

Gerald G. Colella

Mr. Colella has served as our director, and Chief Executive Officer and President since January 2014. From February 2013 until December 2013, Mr. Colella served as our President and Chief Operating Officer. He served as Vice President and Chief Operating Officer from January 2010 until February 2013 and 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 over 30 years of experience within the Company gives him particularly deep insight into the organization.

Peter R. Hanley

Dr. Hanley has served as our director since March 2008. From December 2009 until November 2010, Dr. Hanley served as an occasional consultant to Novellus Systems, Inc., or Novellus (now Lam Research Corporation), a leading developer of semiconductor manufacturing equipment. From January 2004 until December 2007, Dr. Hanley served as a part-time employee of Novellus, engaged primarily in executive training. Dr. Hanley served as President of Novellus from May 2001 to December 2003. Prior to that, he served as Novellus' Executive Vice President of Worldwide Sales from June 1992 until May 2001. Prior to joining Novellus, Dr. Hanley served from 1985 to 1992 at Applied Materials, Inc., a leader in the semiconductor capital equipment industry, most recently as Group Vice President of Worldwide Sales and Service and previously as Vice President and General Manager of their Etch Products Division. Before joining Applied Materials, Inc., Dr. Hanley served from 1978 to 1984 at Varian Associates, a leader in the semiconductor capital equipment industry, most recently as Vice President of Technology and previously as Vice President and General Manager of their Extrinsic Ion Implantation Division. Dr. Hanley has served as a member of the Advisory Board of Orbotech Ltd., a publicly held provider of yield-enhancing and production solutions, since 2014. Dr. Hanley holds a B.S. in Mechanical Engineering from Northeastern University and a Ph.D. in Applied Physics from Cornell University. Dr. Hanley's substantial background in the semiconductor industry for almost 40 years, including senior management roles at Novellus and Applied Materials, two of MKS' largest customers, provides the Board of Directors with insights into the industry's sales and marketing challenges and opportunities.

Rick D. Hess

Mr. Hess has served since July 2014 as Executive Vice President of Analog Devices, Inc., a publicly held semiconductor company, specializing in data conversion and signal processing technology. Before joining Analog Devices, Mr. Hess served as the Chief Executive Officer of Hittite Microwave Corporation from February 2013 to July 2014. 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 (when it was acquired by Analog Devices). 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 microwave, semiconductor, energy and manufacturing industries, including his current role as Executive Vice President of Analog Devices, Inc., qualify him to serve as a member of our Board of Directors.

Jacqueline F. Moloney

Ms. Moloney has served as our director since May 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 Bank Corp, 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

Ms. Mora has served as our director since May 2012. Ms. Mora has served since March 2016 as the Chief Administrative 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 and from 2008 to February 2016 served as the Chief Financial Officer. From 1997 until 2008, she worked for Harvard University, ultimately serving as Chief Financial Officer and Vice President for Finance at the University, 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 the Board of Directors and the Audit Committee.

Robert J. Phillippy

Mr. Phillippy has served as our director since July 2016. Mr. Phillippy has served since July 2016 as an independent consultant, advising technology companies on a range of strategic, operational and organizational

issues. From September 2007 until April 2016 he was the President, Chief Executive Officer and a director of Newport Corporation, which develops, manufactures and supplies lasers, optics and photonics technologies. Mr. Phillippy joined Newport in 1996 and served in various executive management positions prior to his appointment as Chief Executive Officer in 2007. From April 2016 to June 2016 Mr. Phillippy remained employed by Newport to assist in the integration. Mr. Phillippy has over 30 years of experience in technology-related industries, including various sales and marketing management positions at Square D Company, an electrical equipment manufacturer, from 1984 to 1996. Mr. Phillippy holds an M.B.A. from Northwestern University—Kellogg School of Management. In addition, he holds a B.S. in Electrical Engineering from the University of Texas at Austin. Since February 2017, he has served as a director of ESCO Technologies, Inc., a publicly held company that manufactures highly-engineered filtration and fluid control products for the aviation, space and process markets worldwide. Mr. Phillippy brings to the Board of Directors extensive knowledge of Newport, having served as its Chief Executive Officer for over eight years, extensive experience in mergers and acquisitions as well as in new product innovation and international business development.

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.

CORPORATE GOVERNANCE

Board Independence

The Board of Directors has determined that Mr. Hess and all of the members of the Board of Directors, other than Mr. Colella and Mr. Phillippy, are independent as defined under the rules of the NASDAQ Stock Market ("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 for 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;
- 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.

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 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.

Board of Director Meetings and Committees of the Board of Directors

The Board of Directors held five meetings in 2016. During 2016, 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 2016 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.

Audit Committee

The Audit Committee consists of Messrs. Anderson and Beecher (Chair) and Ms. Mora. 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; and
- preparing the Audit Committee report required to be included in the annual proxy statement.

The Audit Committee held six meetings in 2016.

Compensation Committee

The Compensation Committee consists of Mr. Anderson (Chair), Dr. Hanley and Ms. Mora (who replaced Dr. Cristina Amon in May 2016). The Compensation Committee's responsibilities include:

- reviewing and approving, or making recommendations to the Board of Directors with respect to, 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;
- preparing the annual Compensation Committee Report required to be included in the annual proxy statement;
- overseeing and administering our equity incentive plans;
- overseeing our policies on structuring compensation programs compliant with Section 162(m) of the Internal Revenue Code;
- 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 13 meetings in 2016. See the section below entitled “Executive Compensation — Compensation Discussion and Analysis” for further information about the role of the Compensation Committee and the scope of its activities.

Nominating and Corporate Governance Committee

The Nominating and Corporate Governance Committee consists of Mr. Chute (Chair), Dr. Hanley and Ms. Moloney (who replaced Dr. Cristina Amon in May 2016). 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;
- 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 2016.

For information relating to the nomination of directors, see “Director Candidates” below.

Audit Committee Financial Expert

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.

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 III directors. The process followed by the Nominating and Corporate Governance Committee to identify and evaluate director candidates includes 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. Hess, a nominee for director, was identified to the Nominating and Corporate Governance Committee by Gregory R. Beecher, director and Chairman of the Audit Committee.

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., 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.

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 2018 Annual Meeting" below.

Communications from Shareholders

The Board of Directors will give appropriate 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 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., 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.

Compensation Risk Assessment

We conducted 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 2016, the Compensation Committee was comprised of Mr. Anderson and Dr. Hanley and, for the first half of 2016, Dr. Cristina Amon, and for the second half of 2016, Ms. Mora. None of the members of the Compensation Committee during 2016 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.

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:

Seth H. Bagshaw, Vice President, Chief Financial Officer and Treasurer, Age 57

Mr. Bagshaw has served as our Vice President and Chief Financial Officer since January 2010 and as Treasurer since March 2011. 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.

John T.C. Lee, Senior Vice President and Chief Operating Officer, Age 54

Dr. Lee has served as our Senior Vice President and Chief Operating Officer since November 2016. 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 and 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, CIT 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 in nanomanufacturing and technology solutions, 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 the 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 Ph.D. from the Massachusetts Institute of Technology, all in Chemical Engineering.

Brian C. Quirk, Senior Vice President of Global Operations, Age 58

Mr. Quirk has served as our Senior Vice President of Global Operations since January 2014. From May 2006 until December 2013, Mr. Quirk served as our Vice President of Global Operations. Prior to joining MKS, Mr. Quirk served as Vice President of Global Operations and Supply Chain at Brooks Automation, Inc., a provider of automation vacuum and instrumentation solutions. Prior to that, Mr. Quirk held executive leadership roles in global operations at Teradyne, Inc., a semiconductor and system level equipment provider, GenRad, Inc. (acquired by Teradyne, Inc.), a manufacturer of electronic automatic test equipment and related software, and Stratus Computer, Inc. (now known as Stratus Technologies, Inc.), a producer of fault tolerant computer servers. Mr. Quirk has a B.S. in Business Management from Bentley University and an M.B.A. from Suffolk University.

Dennis L. Werth, Senior Vice President of Business Units, Age 62

Mr. Werth has served as our Senior Vice President of Business Units since MKS acquired Newport Corporation in April 2016. Mr. Werth joined Newport Corporation in February 2005, most recently serving as Senior Vice President and General Manager of the Photonics Group from January 2013 until April 2016, and previously as Vice President of the Precision Components and Systems Business. Prior to joining Newport, Mr. Werth served as Senior Director and General Manager of Oriel Instruments, a supplier of products for the making and measuring of light, which was later acquired by Newport Corporation, from January 2004 until February 2005. Prior to joining Oriel, Mr. Werth was the Chief Operating Officer of Isowave, a supplier of advanced optical materials and fiber optic components, from July 2001 to December 2003. From November 1996 to June 2001, he served as Business Segment Leader, Electronic Components and Electronic Article Surveillance, at Allied Signal, Inc., a diversified manufacturer, which merged with Honeywell, Inc. in 1999. Prior to joining Allied Signal, from May 1985 to June 1996, Mr. Werth held various management positions of increasing responsibility at Amoco Corporation, most recently serving as Vice President of Marketing and Business Development of that company's ATx Telecom Systems, Inc. subsidiary (formerly Amoco Laser Company, which Mr. Werth co-founded in 1987 and which was sold to Scientific Atlanta in June 1996).

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.

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:”

| <u>Name</u> | <u>Title</u> |
|--------------------|---|
| Gerald G. Colella | Chief Executive Officer and President |
| Seth H. Bagshaw | Vice President, Chief Financial Officer and Treasurer |
| John T.C. Lee | Senior Vice President and Chief Operating Officer |
| Brian C. Quirk | Senior Vice President of Global Operations |
| Dennis L. Werth(1) | Senior Vice President of Business Units |

(1) Mr. Werth joined the Company on April 29, 2016 in connection with the Company’s acquisition of Newport Corporation.

Following this Compensation Discussion and Analysis, you will find a series of tables containing specific information about the compensation earned or paid in 2016 to our Named Executive Officers.

Executive Summary

Our Business

MKS Instruments, Inc. is a global provider of instruments, subsystems and process control solutions that measure, control, power, deliver, monitor and analyze critical parameters of advanced manufacturing processes to improve process performance and productivity. Our products are derived from our core competencies in automation and control, gas composition analysis, lasers, materials delivery, optics, photonics, pressure, power, reactive gas and vacuum. We also provide services relating to the maintenance and repair of our products, software, service and maintenance, installation services and training. Our primary served markets are manufacturers of capital equipment for semiconductor manufacturing, electronic thin films, life and health sciences, process and industrial technologies, as well as research and defense.

Company Performance in 2016 and Financial Highlights

2016 was a transformational year for MKS. In April 2016, we completed the strategic acquisition of Newport Corporation (“Newport”), a global leader in lasers, optics and photonics, for aggregate consideration of approximately \$1 billion. This acquisition increased our addressable share in our core semiconductor market and has given us critical mass to expand into other adjacent, technology intensive and growing markets including life and health sciences, process and industrial technologies, and research and defense. The acquisition of Newport, which comprises our Light & Motion Division, has extended our expertise into the broad area of light generation, delivery and control including lasers, optics and photonics, which expands our market into additional semiconductor applications including lithography, metrology and inspection.

We also continued to make significant progress to improve our profitability. While maintaining emphasis on leading-edge technology and product development, our focus has been, and continues to be, on improving operational efficiency, eliminating inefficiencies and managing cost across the organization. In integrating Newport, we have followed these same basic principles. For example, we have evaluated the Light & Motion Division’s supply chain to consolidate spending and leverage the true pricing power of our Company and have achieved considerable savings.

In order to successfully capitalize on the growth opportunities that the Newport acquisition provides us, we need talented leadership to continue to drive performance. Over the last year, we continued to strengthen our

management team and structure, including promoting Mr. Werth, former Newport Senior Vice President and General Manager of Newport's Photonics Group, to our executive team to lead our new Light & Motion Division, and promoting Dr. Lee, our former Senior Vice President of Business Units to become our Senior Vice President and Chief Operating Officer.

In addition, MKS accomplished the following in 2016:

- in our historic business, now referred to as our Vacuum & Analysis Division, we grew sales by 7% over a robust 2015, to a record \$872 million, driven by very strong semiconductor sales where we grew by 15% with our best ever semiconductor revenue of \$645 million;
- we continued to work diligently to complete the Newport integration, realizing approximately \$20 million in annualized cost synergies in 2016;
- we completed two successful repricings of our term loan entered into to help finance the Newport acquisition;
- in our Vacuum & Analysis Division, we recorded our highest service revenue to date, which was up 8% in 2016 compared to 2015;
- we returned \$36.4 million to MKS stockholders in cash dividends; and
- we began integrating the sales function to support cross selling of products from both Divisions.

Overview of 2016 Executive Compensation Decisions

In 2016, our Compensation Committee, in consultation with its independent compensation consultant, Meridian Compensation Partners, LLC ("Meridian"), reviewed and analyzed executive officer compensation twice, at the beginning of the year in accordance with past practice and then a second time mid-year following the completion of the acquisition of Newport. When reviewing executive compensation the second time, our Compensation Committee significantly modified MKS' peer group companies to better align the group with the newly combined company's revenues and market capitalization. Our Compensation Committee made this decision mid-year given the additional burdens placed on the executive team to integrate and operate a significantly larger and more complex combined company.

Following completion of the Newport acquisition in April 2016, our Compensation Committee also approved a new hire compensation package for Mr. Werth, former Senior Vice President and General Manager of Newport's Photonics Group, who joined our executive team at the time of the closing of the Newport acquisition to lead our new Light & Motion Division, created as a result of the Newport acquisition.

Also following completion of the Newport acquisition, Meridian, at the request of our Compensation Committee, conducted a peer review of severance pay practices following a change-in-control. Based on data provided by Meridian, the Compensation Committee determined that the severance pay packages in the event of termination following a change-in-control (i.e. double-trigger) then offered to our Named Executive Officers, other than our Chief Executive Officer, were below market. See "Severance and Change-in-Control Provisions" below and "Executive Compensation—Potential Payments Upon Termination or Change-in-Control" for more information about the changes the Compensation Committee made to these severance pay packages.

In November 2016, our Compensation Committee approved a new compensation package for one of our existing Named Executive Officers, Dr. Lee, former Senior Vice President of Business Units, in connection with his promotion to Senior Vice President and Chief Operating Officer of our Company.

The discussion that follows details the compensation decisions made by the Compensation Committee in connection with the above events.

2016 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 2016, our

Named Executive Officers, other than Mr. Werth, received 128% of their target variable cash compensation tied to non-GAAP operating income and 130% of their target performance-based equity compensation tied to non-GAAP cash flow from operations, in each case excluding the effect of the Newport acquisition. 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 2016, we also introduced an individual performance component to our variable cash incentive compensation for all of our Named Executive Officers, other than our Chief Executive Officer, and assigned it a weighting of 20% of total variable cash compensation. We believe assigning individual performance objectives to our executive officers by which they can be measured by their accomplishments in their individual areas of responsibility benefits our shareholders over the long term. The Named Executive Officers who were assigned individual performance goals achieved, on average, 183% of their target variable cash compensation tied to individual performance. Our Compensation Committee did not assign an individual performance component to our Chief Executive Officer's cash incentive compensation because it believes our Chief Executive Officer should be held accountable for the Company's overall performance.

Mr. Werth, whose variable cash compensation and performance-based equity compensation were tied to the financial performance of the Light & Motion Division, received 106% of his target variable cash compensation, which related only to the second half of 2016, and 99% of his target performance-based equity compensation. In addition, our Compensation Committee awarded Mr. Werth additional time-based equity compensation in February 2017 equal to 7% of his target performance-based equity compensation awarded in 2016, due to his strong performance following the Newport acquisition.

When our Compensation Committee set 2016 executive compensation in early 2016, long-term equity incentive compensation comprised 61% of total target compensation for our Chief Executive Officer and 50% 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. When our Compensation Committee reset 2016 executive compensation after the closing of the Newport acquisition, it increased salary and cash incentive compensation but not long-term compensation. As a result, long-term equity incentive compensation comprised 58% of total target compensation for our Chief Executive Officer and 46% of total target compensation, on average, for our other Named Executive Officers. These percentages exclude the one-time equity grants described below. 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.

Following the acquisition, our Compensation Committee awarded our Named Executive Officers certain one-time equity awards. It granted each of Messrs. Colella, Bagshaw, Lee and Quirk a performance-based equity award tied to the achievement of cost synergies from the Newport acquisition. Our Compensation Committee also granted Mr. Werth two one-time equity awards – the first in exchange for forfeiting his rights to certain severance payments and benefits he was entitled to under his severance agreement with Newport, and the second award as a retention award that certain key Newport employees received in connection with the Newport acquisition. These two awards are discussed below under “Elements of Compensation—Dennis Werth's Equity Incentive Compensation.”

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 adjusted operating income. In 2016, prior to the Newport acquisition, our target annual cash incentive compensation comprised 19.3% of total target compensation for our Chief Executive Officer and 19.9% of total target compensation, on average, for our other Named Executive Officers. When our Compensation Committee reset executive compensation after the closing of the Newport acquisition, our target annual cash incentive compensation comprised 21.3% of total target compensation for our Chief Executive Officer and 23.5% of total target compensation, on average, for our other Named Executive Officers.

In 2016, prior to the Newport acquisition, base salary accounted for 19.3% of total target compensation for our Chief Executive Officer and 29.8% of total target compensation, on average, for our other Named Executive Officers. When our Compensation Committee reset executive compensation after the closing of the Newport acquisition, base salary accounted for 20.3% of total target compensation for our Chief Executive Officer and 30.4% of total target compensation, on average, for our other Named Executive Officers. In 2016, prior to the Newport acquisition, our Chief Executive Officer had 80.7% of his total target compensation opportunity tied to annual and long-term incentive compensation and our other Named Executive Officers, on average, had 70.2% of their total target compensation opportunity tied to annual and long-term incentive compensation. When our Compensation Committee reset executive compensation after the closing of the Newport acquisition, our Chief Executive Officer had 79.7% of his total target compensation opportunity tied to annual and long-term incentive compensation and our other Named Executive Officers, on average, had 69.6% of their total target compensation opportunity tied to annual and long-term incentive compensation.

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.

At our 2016 Annual Meeting of Shareholders, held on May 2, 2016 (the "2016 Annual Meeting"), we submitted to our shareholders an advisory vote on executive compensation. Although this annual advisory "say-on-pay" vote is non-binding, the Compensation Committee has considered, and will continue to consider, the outcome of this vote each year when making compensation decisions for our Named Executive Officers. At the 2016 Annual Meeting, our shareholders overwhelmingly approved the compensation of our Named Executive Officers, with approximately 97% of the votes cast voting in favor of the "say-on-pay" proposal.

The Compensation Committee considered the results of the 2016 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 2016 shareholder vote was an endorsement of our compensation and the pay decisions made in relation to our performance.

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 the Company.
- 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 stockholder approval.
- x No hedging or pledging of Company shares.
- x Do not incentivize excessive risk taking.
- x No excessive perquisites.

Elements of Compensation

The following summarizes the compensation elements for our Named Executive Officers. We target each of the various compensation elements, including 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, the Company will and does 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 Salary

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. When our Compensation Committee set 2016 annual executive compensation in early 2016, it approved a salary increase of 7% for our Chief Executive Officer and a salary increase of 4%, on average, for our other Named Executive Officers. When our Compensation Committee reviewed and analyzed 2016 executive compensation after the closing of the Newport acquisition, our Compensation Committee approved a salary increase of 10% for our Chief Executive Officer and a salary increase of 7%, on average, for Messrs. Bagshaw and Quirk, whose roles and responsibilities expanded significantly as a result of the acquisition. These increases were based in part on the compensation data collected from the significantly modified peer group of companies the Compensation Committee selected after the Newport acquisition and which is described below under "Compensation Consultant; Market Comparison."

Dr. Lee received a 6% salary increase in July 2016 as his role and responsibilities increased when he assumed management of the Company's Integrated Solutions Business. Dr. Lee received an additional 7% salary increase in November 2016 when he was promoted to Senior Vice President and Chief Operating Officer of the Company.

When Mr. Werth joined the executive team from Newport Corporation in April 2016 to lead the newly created Light & Motion Division, the Compensation Committee set his salary at \$400,000.

Annual Cash Incentive Compensation

Our annual cash incentive compensation program provides a short-term incentive to reward management for reaching our annual earnings goals and, in certain cases, individual performance objectives, 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. Our annual cash incentive compensation program consists of our stockholder-approved executive cash incentive plan (the “162(m) Plan”) and our annual cash incentive plan.

Pursuant to the terms of the 162(m) Plan, our Compensation Committee established an “umbrella” formula to determine aggregate funding for the plan based on the achievement of a specific, pre-determined Company financial performance goal. Under the umbrella formula, each Named Executive Officer, other than Mr. Werth who joined the Company in April 2016 in connection with the Newport acquisition, was allocated a share of an incentive pool based on the Company’s adjusted operating income for the 2016 fiscal year (defined as GAAP operating income adjusted for restructuring charges, acquisition or divestiture related costs and the effect of acquisitions and divestitures). The Compensation Committee exercises negative discretion from this 162(m) pool by applying the goals of our annual cash incentive plan as described below.

Under our annual cash incentive plan, each Named Executive Officer, other than Mr. Werth who was paid pursuant to a separate cash incentive plan described below, 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 2016 calendar year (i.e., base salary, including regular, holiday, vacation and sick pay, but excluding bonus payments). Bonus payouts were based 80% on a corporate financial performance objective and 20% on individual performance objectives for all Named Executive Officers other than the Company’s Chief Executive Officer, whose annual executive bonus continued to be based entirely on Company financial performance.

In 2016, each Named Executive Officer, other than Mr. Werth, was eligible to receive 50% of his target bonus attributable to the Company performance objective if the minimum threshold was achieved. If we had achieved our target results, each such Named Executive Officer would have been eligible to receive 100% of his target bonus attributable to the Company performance objective, up to a maximum of 200% for achievement in excess of the target results, with proportional payouts for performance between these levels. In the event the minimum threshold for the corporate financial performance objective was not met, but would have been met but for the payment of these bonuses, then in such case a pro rata portion of the bonus would be paid to each such Named Executive Officer, but only to the extent that the corporate financial performance objective after such payment was no less than the minimum corporate financial performance objective.

In 2016, individual performance was measured using specific “management by objective” goals (“MBOs”) that were aligned to our strategic objectives and priorities and each Named Executive Officer’s business unit or function. Our Compensation Committee decided to incorporate MBOs into the annual executive bonus program to enhance each Named Executive Officer’s focus on business objectives, such as operational objectives and strategic initiatives, which are key to the long-term success of the Company. Our Chief Executive Officer develops these individual performance objectives for his direct reports which focus on the measurable accomplishments in their individual areas of responsibility that will benefit our shareholders over the long term.

Listed below is a summary of each Named Executive Officer's performance against his 2016 individual objectives.

**2016 Named Executive Officer MBOs under Annual Cash Incentive Plan
(20% of Target Cash Incentive)**

| <u>Name</u> | <u>Management by Objective Goals</u> | <u>Weight</u> | <u>Results</u> | <u>Achievement Level</u> |
|-----------------|---|---------------|--|--------------------------|
| Seth H. Bagshaw | Improve 2016 Operating Model | 25% | Target Operating Model improved four times in 2016 with 85% increase in non-GAAP earnings per share | 200% |
| | Achieve Cash Conversion Cycle Improvements | 25% | Achieved tax efficient repatriation of \$230 million of international cash; achieved \$150 million of voluntary debt prepayments | 200% |
| | Achieve Acquisition Objectives | 25% | Successful acquisition of Newport Corporation achieving strategic and financial objectives | 200% |
| | Implement Information Technology Roadmap | 25% | Achieved 2016 Information Technology roadmap and successful Information Technology integration of Newport Corporation | 200% |
| John T.C. Lee | Improve 2016 Operating Model | 25% | Target Operating Model related to Vacuum & Analysis Division improved in 2016 | 150% |
| | Achieve Strategic Planning Goals | 25% | Drove Business Units to meet or exceed strategic planning goals on 97% of initiatives, including market, technology and applications goals | 150% |
| | Drive New Product Releases | 25% | Drove the release of multiple new product versions | 150% |
| | Achieve Acquisition Objectives | 25% | Achieved select integration and cost synergy targets in 2016 related to the acquisition of Newport Corporation | 150% |
| Brian C. Quirk | Improve 2016 Operating Model | 25% | Target Operating Model improved four times in 2016 with 85% increase in Non-GAAP earnings per share | 200% |
| | Increase Operational Excellence through Manufacturing and Supply Chain Efficiencies | 25% | Achieved targeted production transfers to high volume/low cost country production sites on schedule and within budget | 200% |
| | Review Operations Processes for Improvement | 25% | Achieved Operations key performance indicator goals | 200% |
| | Achieve Acquisition Objectives | 25% | Successful acquisition of Newport Corporation achieving strategic and financial objectives | 200% |

In 2016, payouts for corporate financial performance under the annual cash incentive plan were determined by multiplying a Named Executive Officer's "Target Bonus Amount" by the "Corporate Performance Multiplier," each as discussed below. Target Bonus Amount is the amount determined by multiplying each Named Executive Officer's eligible earnings in 2016 by the Target Bonus Percentages determined by our Compensation Committee each year. When our Compensation Committee set 2016 annual executive compensation in early 2016, they did not approve any increases to Target Bonus Percentages for our Named Executive Officers. However, when our Compensation Committee reviewed and analyzed 2016 executive compensation after the closing of the Newport acquisition, our Compensation Committee approved a Target Bonus Percentage increase of 5 percentage points, effective January 1, 2016, for Messrs. Colella, Bagshaw and Quirk, whose roles and responsibilities expanded significantly as a result of the acquisition. These increases were based in part on the compensation data collected from the significantly modified peer group of companies the Compensation Committee selected after the Newport acquisition and which is described below under "Compensation Consultant; Market Comparison."

Dr. Lee received a Target Bonus Percentage increase of fifteen percentage points in November 2016 when he was promoted to Senior Vice President and Chief Operating Officer of the Company. This increase took effect on November 1, 2016 resulting in the blended rate listed below for the 2016 year.

Listed below is the 2016 Target Bonus Percentage for each Named Executive Officer.

| <u>Named Executive Officer</u> | <u>2016 Target Bonus Percentage</u> |
|--------------------------------|-------------------------------------|
| Gerald G. Colella | 105% |
| Seth H. Bagshaw | 80% |
| John T.C. Lee | 77.5% |
| Brian C. Quirk | 60% |

In 2016, the Corporate Performance Multiplier, which is a percentage, was based upon our achievement of adjusted operating income after bonus and excluding special items. Participants would not receive any portion of their Target Bonus Amount tied to Company financial performance if such adjusted operating income (before the calculation of bonus) was less than the minimum threshold of \$66.6 million. The Corporate Performance Multiplier would be 50% of a Participant's Target Bonus Amount if such adjusted operating income was \$66.6 million, would be 100% if such adjusted income was \$133.3 million, and would be the maximum 200% if such adjusted operating income was \$266.5 million or more, with proportional payments for achievement in between these levels. In 2016, because our adjusted operating income after bonus and excluding special items was \$170.7 million, participants were eligible to receive 128% of their Target Bonus Amounts tied to Company financial performance under this formula.

Listed below are our Chief Executive Officer's and other Named Executive Officers' earned cash bonus payouts based on the achievement of the Company performance metric weighted at 100% of target for Mr. Colella, and 80% of target and the individual performance objectives weighted at 20% of target for the other Named Executive Officers.

| <u>Named Executive Officer</u> | <u>Company Financial Achievement</u> | <u>Individual Objective Achievement</u> | <u>Cash Payout</u> | <u>Payment as a Percent of Target</u> |
|--------------------------------|--------------------------------------|---|--------------------|---------------------------------------|
| Gerald G. Colella | 128% | N/A | \$1,018,390 | 128% |
| Seth H. Bagshaw | 128% | 200% | \$ 520,280 | 142% |
| John T.C. Lee | 128% | 150% | \$ 467,781 | 132% |
| Brian C. Quirk | 128% | 200% | \$ 309,296 | 142% |

For 2016, our incentive pool was funded based on 20% of the Company's adjusted operating income for the 2016 fiscal year (defined as GAAP operating income adjusted for restructuring charges, acquisition or divestiture related costs and the effect of acquisitions and divestitures), but not to exceed \$6 million. Mr. Colella was allocated 40% of the incentive pool and the other Named Executive Officers were each allocated 15% of the pool. The Company's adjusted operating income for 2016 was \$170.7 million, which resulted in a bonus pool of \$6 million under the terms of the 162(m) Plan, of which \$2.3 million was distributed to our Named Executive Officers as described above.

For 2017, executive bonuses will be similar to 2016 where Company performance will account for 80% of the Named Executive Officer's cash bonus target and individual performance will account for the remaining 20% for all Named Executive Officers, other than the Company's Chief Executive Officer, whose annual executive bonus will continue to be based entirely on Company performance. Company performance will be measured using the same financial metric as in previous years, adjusted operating income excluding special items, and individual performance will be measured using specific MBOs that are aligned to our strategic objectives and priorities and each Named Executive Officer's division or function. The MBOs approved by the Compensation Committee for 2017 include, but are not limited to, improving operating processes and tools, achieving integration and synergy objectives, driving new product releases, increasing operational excellence through manufacturing and supply chain efficiencies and improving our information technology model.

Dennis Werth's Cash Incentive Compensation

When Mr. Werth joined our executive team from Newport Corporation in April 2016 to lead the Light & Motion Division, the Compensation Committee set his Target Bonus Percentage at 75% of his 2016 salary as set forth in his new hire package. They also approved a bonus plan for Mr. Werth, the terms of which were similar to the one approved for all other Named Executive Officers described above except the financial performance metric was adjusted operating income for the Light & Motion Division for the second half of 2016. In addition, prior to the Newport acquisition, Mr. Werth had been eligible to earn a bonus under a Newport executive bonus plan covering the first half of the 2016 calendar year, which we paid in accordance with the terms of that bonus plan in July 2016.

For Mr. Werth's second half 2016 cash incentive plan, the Corporate Performance Multiplier was based on the Light & Motion Division's achievement of adjusted operating income excluding special items for the second half of 2016. Mr. Werth would not receive any portion of his Target Bonus if such adjusted operating income for such period was less than the minimum threshold of \$16.6 million. The Corporate Performance Multiplier would be 50% of Mr. Werth's Target Bonus Amount if such adjusted operating income was \$16.6 million, would be 100% if such adjusted operating income was \$39.6 million, and would be the maximum 200% if such adjusted operating income was \$64.1 million or more, with proportional payments for achievement in between. In 2016, because the Light & Motion Division's adjusted operating income excluding special items was \$39.0 million for the second half of 2016, Mr. Werth was eligible to receive 99% of his Target Bonus Amount under this formula.

Our Compensation Committee has the authority to make other cash bonus awards to our Named Executive Officers as it deems appropriate. In January 2017, our Compensation Committee awarded Mr. Werth an additional 7% of his Target Bonus Amount for the second half of 2016 in recognition of his contributions following the closing of the Newport acquisition. As a result, Mr. Werth received an aggregate payout of 106% of his target annual incentive compensation for the second half of 2016.

In 2017, Mr. Werth will participate in the same annual cash incentive plan as all other Named Executive Officers, the details of which are summarized above.

Long-Term Equity Incentive Compensation

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.

Annual Equity Award to the Named Executive Officers

When our Compensation Committee set 2016 annual executive compensation in early 2016, it awarded the following time-based and performance-based RSUs to our Chief Executive Officer and our other Named

Executive Officers, other than Mr. Werth whose equity compensation is discussed below. These RSUs vest in three equal annual installments. The performance-based RSUs are subject to a one year performance metric described below.

| <u>Named Executive Officer</u> | <u>Grant Date Value of Performance-Based RSUs(1)</u> | <u>Number of Performance-Based RSUs(1)</u> | <u>Grant Date Value of Time-Based RSUs</u> | <u>Number of Time-Based RSUs</u> |
|--------------------------------|--|--|--|----------------------------------|
| Gerald G. Colella | \$1,200,000 | 36,122 | \$1,100,000 | 33,112 |
| Seth H. Bagshaw | \$ 530,000 | 15,954 | \$ 450,000 | 13,546 |
| John T.C. Lee | \$ 400,000 | 12,040 | \$ 400,000 | 12,040 |
| Brian C. Quirk | \$ 215,000 | 6,472 | \$ 215,000 | 6,472 |

(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 corporate financial performance metric that best aligns with our corporate objectives. Recently, including in 2016, our corporate 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. We believe 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. Because RSUs are worth more than options on the date of grant, we are able to grant fewer of them than options, resulting in less dilution to shareholders' holdings.

Mr. Werth did not receive performance-based RSUs when the other Named Executive Officers did due to the fact that he joined the Company as a result of the Newport acquisition which occurred after the 2016 equity awards were determined. His equity awards are discussed below under "Dennis Werth's Equity Incentive Compensation."

In 2016, our Named Executive Officers, other than Mr. Werth, would have forfeited all of their performance-based RSUs if our adjusted cash flow from operations was less than \$29.6 million at a revenue level of \$500 million, or if such cash flow was less than \$176.8 million at a revenue level of \$1.0 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 \$39.9 million or more at a revenue level of \$500 million, or was greater than \$238.9 million at a revenue level of \$1.0 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 2016, because our adjusted cash flow was \$178.0 million, after removing the impact of acquisition related charges, charges for restructuring, asset impairment charges, other non-standard gains or losses and the tax effects of the above adjustments, and our revenue level was \$872.4 million excluding the impact of the Newport acquisition, our Named Executive Officers received 130% 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.

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.

Special Performance-Based Equity Award to our Named Executive Officers

In July 2016, our Compensation Committee awarded the following special performance-based RSUs to our Chief Executive Officer and our other Named Executive Officers, other than Mr. Werth, whose equity compensation is discussed below. These awards vest over two years if the Company achieves certain cost synergies in connection with the Newport acquisition by the end of year one and year two. Our Compensation Committee made these awards to further incentivize our executive team to achieve the cost synergies stockholders desire from the Newport acquisition.

| <u>Named Executive Officer</u> | <u>Grant Date Value of Performance-Based RSUs</u> | <u>Number of Performance-Based RSUs</u> |
|--------------------------------|---|---|
| Gerald G. Colella | \$400,000 | 9,487 |
| Seth H. Bagshaw | \$250,000 | 5,929 |
| John T.C. Lee | \$150,000 | 3,557 |
| Brian C. Quirk | \$150,000 | 3,557 |

Dennis Werth's Equity Incentive Compensation

When Mr. Werth joined our executive team from Newport Corporation in April 2016 to lead the Light & Motion Division, he received the following three equity awards:

- an annual RSU award similar to the annual RSU award our other Named Executive Officers receive, with a grant date value of \$500,000, 50% of which was time-based and the remaining 50% was performance-based, which vests in equal annual installments over three years. The performance-based RSU award was subject to the same one year performance metric as Mr. Werth's cash incentive compensation, Light & Motion Division's achievement of adjusted operating income excluding special items, for the second half of 2016. Mr. Werth would have forfeited all of his performance-based RSUs if such adjusted operating income for such period was less than the minimum threshold of \$16.6 million. He would receive 50% of his performance-based RSUs if such adjusted operating income was \$16.6 million. If such adjusted operating income was \$51.8 million or more, Mr. Werth would receive the maximum of 150% of his performance-based RSUs, with proportional payments for achievement in between these levels. Because the Light & Motion Division's adjusted operating income excluding special items was \$39.0 million for the second half of 2016, Mr. Werth was eligible to receive 99% of his performance-based RSUs under this formula. In addition, our Compensation Committee awarded Mr. Werth additional time-based RSUs in February 2017 with a value equal to 7% of his target performance-based equity compensation awarded in 2016, due to his strong performance following the Newport acquisition. These RSUs vest in equal installments over three years from the date of grant.
- a one-time retention award with a grant date value of \$150,000, which was time-based and vested over three years with 20% vesting in year one, 30% in year two and 50% in year three, and
- a one-time special award with a grant date value of \$554,400, which was also time-based (the "Waiver Award") and vested over three years like the one-time retention award discussed above. The purpose of the Waiver Award was to compensate Mr. Werth for forfeiting certain rights to certain severance payments and benefits that he was entitled to under his Newport severance agreement. Our Compensation Committee's goal in awarding Mr. Werth the Waiver Award was to align his rights to severance payments and benefits both before and after a change-in-control of the Company with the rights of our other Named Executive Officers. In exchange for receiving the special award, Mr. Werth agreed to terminate his severance agreement with Newport and entered into a new employment agreement with severance payments similar to those of our other Named Executive Officers other than our Chief Executive Officer. For a description of the severance and change-in-control payments each of our Named Executive Officers is entitled to, see "Executive Compensation – Potential Payments Upon Termination or Change-in-Control."

Supplemental Retirement Benefits

We provide supplemental retirement benefits, including supplemental lifetime retiree medical benefits, to our current Chief Executive Officer and President, 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 the 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 and President.

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.

Newport Deferred Compensation Plan

In connection with the Newport acquisition, we assumed Newport's Deferred Compensation Plan. Historically, Mr. Werth has made elections to defer a portion of his compensation into this plan. He did not make such an election in 2015 for 2016 compensation. In 2016, Newport employees 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 it is expected that these employees, including Mr. Werth, will have the opportunity to make an election to defer their 2017 annual incentive compensation to the extent earned and paid in 2018. It is expected that after this election, no further elections will be permitted under this plan.

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, health and life insurance reimbursements, 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 is entitled to certain payments and benefits in the event his employment terminates under specified circumstances as described in the applicable agreement. Following completion of the Newport acquisition, Meridian, at the request of our Compensation Committee, conducted a peer review of severance pay practices following a change-in-control. Based on data provided by Meridian, the Compensation Committee determined that the severance pay packages in the event of termination following a change-in-control (i.e., double trigger) then offered to our Named Executive Officers, other than our Chief Executive Officer, were below market and accordingly, approved certain changes as set forth below:

- increased the protection period for cash severance benefits from six months to 24 months following a change-in-control;
- increased cash severance benefit from six months of salary to two times annual salary plus target bonus for our Chief Financial Officer and one and a half times annual salary plus target bonus for our other Named Executive Officers;
- provided for health care benefits for 24 months for our Chief Financial Officer and 18 months for our other Named Executive Officers; and
- provided for a stub year bonus on a pro rata basis at target for our Named Executive Officers.

For more information about these severance payments and benefits, see “Executive Compensation—Potential Payments Upon Termination or Change-in-Control.”

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 the 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 his Waiver Award, 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 — Potential Payments Upon Termination or Change-in-Control” for more information about these agreements.

Compensation of our Chief Executive Officer

MKS 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, see “Executive Compensation — 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, see “Executive Compensation — Potential Payments Upon Termination or Change-in-Control.”

Compensation Consultant; Market Comparison

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 and the Company 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 Company 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.

When initially determining executive compensation for 2016, the Compensation Committee, with the assistance of Meridian, reviewed size and industry-appropriate broad survey data from the 2015 Radford Global Technology Survey for our Named Executive Officers, as well as publicly available compensation data from the following comparable peer companies:

Advanced Energy Industries, Inc.
Brooks Automation, Inc.
Coherent, Inc.
Entegris, Inc.
ESCO Technologies, Inc.
FEI Company
FLIR System, Inc.
Kulicke & Soffa Industries, Inc.
Mentor Graphics Corporation
Microsemi Corporation
MTS Systems Corporation

National Instruments Corporation
Newport Corporation
Photronics, Inc.
Plantronics, Inc.
Teradyne, Inc.
Ultra Clean Holdings Inc.
Viavi Solutions, Inc. (formerly JDS Uniphase Corporation)
Veeco Instruments, Inc.
Xcerra Corp.

These peer companies were selected because they compete in the semiconductor industry and were similar to MKS in terms of revenue and market capitalization. These were the same peer companies used to determine 2015 compensation.

In May 2016, following the closing of the Company's acquisition of Newport, the Compensation Committee engaged Meridian to prepare a competitive compensation analysis for each of our executives on a position-by-position basis based on estimated revenue and market capitalization of the combined company of \$1.4 billion and \$2.5-\$3.0 billion, respectively. At that time, the peer group of companies listed above that our Compensation Committee used to determine 2016 executive compensation at the beginning of 2016 was substantially modified given the revenue and market capitalization of the combined company. The peer companies listed above with annual revenue below \$550 million (Advanced Energy Industries, Inc., ESCO Technologies, Inc., Kulicke & Soffa Industries, Inc., Microsemi Corporation, MTS Systems Corporation, Photronics, Inc., Ultra Clean Holdings Inc., Veeco Instruments, Inc. and Xcerra Corp.) were removed, except for Brooks Automation, Inc. due to its similar business focus on vacuum solutions. Publicly available compensation data from the following comparable peer companies was used in determining revised executive compensation for 2016:

Amkor Technology Inc.
Brooks Automation, Inc.
Coherent, Inc.
Cypress Semiconductor Corp.
Entegris, Inc.
FEI Company
Finisar Corp.

FLIR System, Inc.
Linear Technology Corp.
Mentor Graphics Corporation
National Instruments Corporation
Plantronics, Inc.
Teradyne, Inc.
Viavi Solutions, Inc. (formerly JDS Uniphase Corporation)

The revised list of peer companies was chosen based on similar industry, market capitalization and revenue, with a revenue range relative to the Company's projected revenue of between .4 times and 2 times, which was the same range used to determine the original list of peer companies for setting 2016 compensation. Our Compensation Committee also considered size and industry-appropriate broad survey data from the 2016 Radford Global Technology Survey.

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 corporate 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.

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 four 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 three times the annual retainer to four times effective in 2017.

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 (“Section 162(m)”), generally disallows a tax deduction to public companies for compensation in excess of \$1 million per person paid to a company’s chief executive officer and the next three most highly-paid executive officers other than the chief financial officer. Certain compensation, including qualified performance-based compensation, will not be subject to the deduction limit if certain requirements are met. The Compensation Committee reviews the potential effect of Section 162(m) periodically. In May 2014, our shareholders approved the 2014 Stock Incentive Plan which permits the grant of Section 162(m) qualified performance-based RSUs and restricted stock. In May 2015, our shareholders approved our 162(m) Plan so that cash awards under such plan may qualify as performance-based

compensation under Section 162(m). The Compensation Committee reserves the right to use its judgment to authorize compensation payments which are not qualified as performance-based compensation under Section 162(m) and which may be in excess of the Section 162(m) limit when the Compensation Committee believes such payments are appropriate, after taking into consideration changing business conditions or the officer's performance, and are in the best interests of our shareholders.

Impact of ASC 718

We account for stock-based compensation in accordance with the requirements of Financial Accounting Standards Board Accounting Standards Codification 718 ("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,

Robert R. Anderson, Chair
Peter R. Hanley
Elizabeth A. Mora

Summary Compensation Table for 2016

The following table sets forth the aggregate amounts of compensation earned by our Named Executive Officers in the years ended December 31, 2016, 2015 and 2014.

| Name and Principal Position | Year | Salary (\$) | Bonus (\$) | Stock Awards (\$)(1) | Non-Equity Incentive Plan Compensation (\$)(2) | Change in Pension Value and Nonqualified Deferred Compensation Earnings (\$)(3) | All Other Compensation (\$)(4) | Total (\$) |
|---|------|--------------|------------|----------------------|--|---|--------------------------------|-------------|
| Gerald G. Colella, Chief Executive Officer and President (principal executive officer) | 2016 | \$757,731 | - | \$2,700,000 | \$1,018,390 | \$2,038,038 | \$62,855 | \$6,577,014 |
| | 2015 | \$673,077 | - | \$2,050,000 | \$767,308 | \$1,979,663 | \$57,936 | \$5,527,984 |
| | 2014 | \$597,308 | - | \$1,400,000 | \$746,635 | \$1,591,840 | \$63,604 | \$4,399,387 |
| | | | | | | | | |
| Seth H. Bagshaw, Vice President, Chief Financial Officer and Treasurer (principal financial officer) | 2016 | \$456,707 | - | \$1,230,000 | \$520,280 | N/A | \$67,448 | \$2,274,435 |
| | 2015 | \$424,038 | - | \$850,000 | \$362,553 | N/A | \$58,982 | \$1,695,573 |
| | 2014 | \$398,654 | - | \$750,000 | \$373,738 | N/A | \$68,449 | \$1,590,841 |
| | | | | | | | | |
| John T. C. Lee, Sr. Vice President and Chief Operating Officer | 2016 | \$455,882 | - | \$950,000 | \$467,781 | N/A | \$71,000 | \$1,944,663 |
| | 2015 | \$424,038 | \$3,000(6) | \$650,000 | \$362,553 | N/A | \$70,108 | \$1,509,699 |
| | 2014 | \$398,654 | - | \$500,000 | \$348,822 | N/A | \$67,220 | \$1,314,696 |
| | | | | | | | | |
| Brian C. Quirk, Sr. Vice President of Global Operations | 2016 | \$362,004 | - | \$580,000 | \$309,296 | N/A | \$63,702 | \$1,315,002 |
| | 2015 | \$339,423 | - | \$375,000 | \$212,818 | N/A | \$61,769 | \$989,010 |
| | 2014 | \$323,923 | - | \$350,000 | \$222,697 | N/A | \$60,796 | \$957,416 |
| | | | | | | | | |
| Dennis L. Werth, Sr. Vice President of Business Units | 2016 | \$277,115(5) | - | \$1,204,400 | \$274,284 | N/A | \$18,030 | \$1,773,829 |

- (1) Represents the grant date fair value for each RSU granted to the executive officer during the covered year, calculated in accordance with Accounting Standards Codification (“ASC”) 718. The assumptions used in determining the grant date fair values of awards are set forth in Note 18 to our consolidated financial statements, which are included in our Annual Report on Form 10-K filed with the SEC on March 1, 2017. The amounts under the “Stock Awards” column do not reflect the amount of compensation actually received by the Named Executive Officer during the fiscal year. Approximately 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 2016, 2015 and 2014, respectively, or 2016 in the case of Mr. Werth: Mr. Colella: \$3,300,000, \$2,575,000 and \$1,750,000; Mr. Bagshaw: \$1,495,000, \$1,075,000 and \$937,500; Dr. Lee: \$1,150,000, \$812,500 and \$625,000; Mr. Quirk: \$687,500, \$468,750 and \$437,500 and Mr. Werth: \$1,329,400. Based on the achievement against the performance metric, the actual value of the RSUs awarded in 2016 was as follows: Mr. Colella: \$3,060,000; Mr. Bagshaw: \$1,389,000; Dr. Lee: \$1,070,000; Mr. Quirk: \$644,500 and Mr. Werth: \$1,201,900. Based on the achievement against the performance metric, the actual value of the RSUs awarded in 2015 was as follows: Mr. Colella: \$2,291,500; Mr. Bagshaw: \$953,500; Dr. Lee: \$724,750 and Mr. Quirk: \$418,125. Based on the achievement against the performance metric, the actual value of the RSUs awarded in 2014 was as follows: Mr. Colella: \$1,750,000; Mr. Bagshaw: \$937,500; Dr. Lee: \$625,000 and Mr. Quirk: \$437,500.
- (2) For 2016, 2015 and 2014, each Named Executive Officer’s annual cash performance bonus (except for Mr. Werth, whose annual cash bonus calculation is described below) was calculated based on a specified

target percentage of his eligible earnings for the relevant plan year, called a “Target Bonus Amount.” The threshold bonus payout was 50% of this Target Bonus Amount and the maximum payout was 200% of this Target Bonus Amount, with proportional payouts for performance between these levels. For 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 continued to be based entirely on Company financial performance. Company financial performance was based on the achievement of adjusted operating income for the 2016 fiscal year (defined as GAAP operating income adjusted for restructuring charges, acquisition related costs and impairment charges related to acquisitions). Individual performance was based on specific management by objective goals that were aligned with the Company’s strategic objectives and priorities. For 2016, the Target Bonus Amount for each of the Named Executive Officers was equal to that Named Executive Officer’s eligible earnings for 2016 multiplied by the following percentages: Mr. Colella — 105%; Mr. Bagshaw — 80%; Dr. Lee — 77.5% and Mr. Quirk — 60%. In 2015, the percentages for the Named Executive Officers were: Mr. Colella — 100%; Mr. Bagshaw — 75%; Dr. Lee — 75% and Mr. Quirk — 55%. In 2014, the percentages for the Named Executive Officers were: Mr. Colella — 100%; Mr. Bagshaw — 75%; Dr. Lee — 70% and Mr. Quirk — 55%. For 2016, we paid a bonus of 128% of the Target Bonus Amount tied to Company financial performance and an average of 183% of the Target Bonus Amount tied to individual performance. Prior to 2016, annual cash performance bonuses were based entirely on Company financial performance. For 2015, we paid a bonus of 114% of the Target Bonus Amount for each Named Executive Officer. For 2014, we paid a bonus of 124% of the Target Bonus Amount for each Named Executive Officer. 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, or \$109,572. 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 his Target Bonus Amount was equal to 75% of his eligible earnings for the second half of 2016, his performance metric was adjusted operating income for the Light & Motion Division for this six month period (defined as GAAP operating income adjusted for amortization of intangibles, restructuring charges, and the effect of synergies resulting from the acquisition of Newport) and 100% of his bonus was based on this financial metric. For the second half of 2016, we paid Mr. Werth a bonus of 106% of his Target Bonus Amount, or \$164,712. For more information about the annual cash incentive plan and Mr. Werth’s second half 2016 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.”

- (3) Our employment agreement with Mr. Colella provides for supplemental retirement benefits. For 2016, 2015 and 2014, the amount listed represents the actuarial increase in present value from the prior fiscal year.
- (4) For Mr. Colella: with respect to 2016, this amount was comprised of \$16,664 for car related expenses, \$6,470 for golf membership, \$29,821 for company paid health and life insurance, \$1,950 for his executive physical and \$7,950 for 401(k) matching contributions; with respect to 2015, this amount was comprised of \$16,115 for car related expenses, \$6,470 for golf membership, \$27,401 for company paid health and life insurance and \$7,950 for 401(k) matching contributions; with respect to 2014, this amount was comprised of \$27,594 for car related expenses, \$6,165 for golf club membership, \$22,045 for company paid health and life insurance and \$7,800 for 401(k) matching contributions. For Mr. Bagshaw: with respect to 2016, this amount was comprised of \$10,560 for car related expenses, \$6,470 for golf membership, \$37,729 for company paid health and life insurance, \$2,850 for his executive physical, a discretionary gift card award of \$1,000 plus a tax gross up of \$889 and \$7,950 for 401(k) matching contributions; with respect to 2015, this amount was comprised of \$8,862 for car related expenses, \$6,470 for golf membership, \$35,700 for company paid health and life insurance and \$7,950 for 401(k) matching contributions; with respect to 2014, this amount was comprised of \$26,027 for car related expenses, \$6,165 for golf club membership, \$28,457 for company paid health and life insurance and \$7,800 for 401(k) matching contributions. For Dr. Lee: with respect to 2016, this amount was comprised of \$13,634 for car related expenses, \$6,470 for golf membership, \$42,946 for company paid health and life insurance and \$7,950 for 401(k) matching contributions; with respect to 2015, this amount was comprised of \$13,516 for car related expenses, \$6,470 for golf membership, \$42,172 for company paid health and life insurance and \$7,950 for 401(k) matching

contributions; with respect to 2014, this amount was comprised of \$23,093 for car related expenses, \$6,165 for golf club membership, \$29,312 for company paid health and life insurance, \$850 for a patent award and \$7,800 for 401(k) matching contributions. For Mr. Quirk: with respect to 2016, this amount was comprised of \$7,880 for car related expenses, \$6,470 for golf membership, \$38,012 for health and life insurance, \$2,650 for his executive physical, a discretionary gift card award of \$500 plus a tax gross up of \$240 and \$7,950 for 401(k) matching contributions; with respect to 2015, this amount was comprised of \$12,837 for car related expenses, \$6,470 for golf membership, \$34,512 for health and life insurance and \$7,950 for 401(k) matching contributions; with respect to 2014, this amount was comprised of \$30,543 for car related expenses, \$6,165 for golf membership, \$16,288 for company paid health and life insurance and \$7,800 for 401(k) matching contributions. For Mr. Werth, this amount was comprised of \$4,200 in car related expenses and \$13,830 for company paid health and life insurance that we paid since he joined our Company in April 2016.

- (5) Mr. Werth joined the Company on April 29, 2016 in connection with the Company's acquisition of Newport Corporation.
- (6) For Dr. Lee, with respect to 2015, this discretionary cash award of \$3,000 was given to him in recognition of his contributions to the Office of the Chief Technology Officer.

Grants of Plan-Based Awards in Fiscal Year 2016

| 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 or Units (#) | Grant Date Fair Value of Stock Awards (\$) (4) |
|-------------------|---------------|--|-------------|--------------|--|------------|-------------|--|--|
| | | Threshold (\$) | Target (\$) | Maximum (\$) | Threshold (#) | Target (#) | Maximum (#) | | |
| Gerald G. Colella | N/A | \$400,313 | \$800,625 | \$1,601,250 | | | | | |
| | 2/16/2016 | | | | 18,061 | 36,122 | 54,184 | 33,112(6) | \$2,300,000 |
| | 7/05/2016 | | | | 9,487(5) | 9,487(5) | 9,487(5) | | \$ 400,000 |
| Seth H. Bagshaw | N/A | \$183,452 | \$366,904 | \$ 733,808 | | | | | |
| | 2/16/2016 | | | | 7,977 | 15,954 | 23,931 | 13,546(6) | \$ 980,000 |
| | 7/05/2016 | | | | 5,929(5) | 5,929(5) | 5,929(5) | | \$ 250,000 |
| John T.C. Lee | N/A | \$178,194 | \$356,388 | \$ 712,776 | | | | | |
| | 2/16/2016 | | | | 6,020 | 12,040 | 18,061 | 12,040(6) | \$ 800,000 |
| | 7/05/2016 | | | | 3,557(5) | 3,557(5) | 3,557(5) | | \$ 150,000 |
| Brian C. Quirk | N/A | \$109,005 | \$218,010 | \$ 436,020 | | | | | |
| | 2/16/2016 | | | | 3,236 | 6,472 | 9,708 | 6,472(6) | \$ 430,000 |
| | 7/05/2016 | | | | 3,557(5) | 3,557(5) | 3,557(5) | | \$ 150,000 |
| Dennis L. Werth | N/A | \$ 60,000 | \$120,000 | \$ 240,000 | | | | | |
| | N/A | \$ 75,000 | \$150,000 | \$ 300,000 | | | | | |
| | 5/31/2016 | | | | 3,050 | 6,100 | 9,150 | 6,100(6) | \$ 500,000 |
| | 5/31/2016 | | | | | | | 3,660(7) | \$ 150,000 |
| | 5/31/2016 | | | | | | 13,528(7) | \$ 554,400 | |

- (1) This column shows the date of grant for all equity awards granted in 2016.
- (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 2016 is reported under the Non-Equity Incentive Plan Compensation column in the Summary Compensation Table for 2016. See Footnote 2 to the Summary Compensation Table for 2016 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 2017, subject to achievement of performance criteria determined in February 2017.

- (4) Reflects the combined grant date fair value of performance-based RSUs at the target achievement level and time-based RSUs. The fair value was \$33.22 per share for RSUs awarded on February 16, 2016, \$40.98 per share for RSUs awarded on May 31, 2016 and \$42.16 per share for RSUs awarded on July 5, 2016.
- (5) These RSUs vest in two equal annual installments in June 2017 and June 2018, subject to the achievement of performance criteria determined in June 2017 and June 2018.
- (6) These RSUs vest in equal annual installments over three years beginning in February 2017.
- (7) These RSUs vest in three annual installments as follows: 20% vest in February 2017, 30% in February 2018 and 50% in February 2019.

Outstanding Equity Awards at 2016 Fiscal Year-End

| Name | Option Awards | | | | Stock Awards(1) | | | |
|-------------------|---|-------------------------------------|---|--|--|---|---|---|
| | 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 or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested(2) (\$) |
| | Exercisable | Unexercisable | | | | | | |
| Gerald G. Colella | | | | | 20,088(5) 43,339(6) 33,112(7) | \$1,193,282 \$2,574,342 \$1,966,887 | 54,184(7) 9,487(12) | \$3,218,543 \$ 563,567 |
| Seth H. Bagshaw | | | | | 10,762(5) 18,033(6) 13,546(7) | \$ 639,266 \$1,071,199 \$ 804,636 | 23,931(7) 5,929(12) | \$1,421,523 \$ 352,230 |
| John T.C. Lee | | | | | 7,175(5) 13,707(6) 12,040(7) | \$ 426,197 \$ 814,213 \$ 715,232 | 18,061(7) 3,557(12) | \$1,072,848 \$ 211,338 |
| Brian C. Quirk | | | | | 5,022(5) 7,908(6) 6,472(7) | \$ 298,332 \$ 469,777 \$ 384,437 | 9,708(7) 3,557(12) | \$ 576,656 \$ 211,338 |
| Dennis L. Werth | 4,199 5,911 10,313 5,905 2,455 | - - - 2,953(3) 4,911(4) | \$27.79 \$27.89 \$22.39 \$29.80 \$31.13 | 05/17/18 04/12/19 05/20/20 05/19/21 05/19/22 | 2,952(8) 4,911(9) 6,100(10) 3,660(11) 13,528(11) | \$ 175,349 \$ 291,713 \$ 362,372 \$ 217,423 \$ 803,596 | 9,150(10) | \$ 543,558 |

- (1) Except as otherwise noted below, all RSUs vest in three equal annual installments. For RSUs granted in 2014, the annual vesting date is the anniversary of the grant date. For RSUs granted in 2015 and 2016, the annual vesting date is February 15th or the next business day if February 15th is not a business day. RSUs listed in "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 30, 2016 of \$59.40 per share.
- (3) Consists of stock-settled stock appreciation rights that were awarded on May 19, 2014, which had not vested as of December 31, 2016. The remainder of such awards vest on March 31, 2017.
- (4) Consists of stock-settled stock appreciation rights that were awarded on May 19, 2015, which had not vested as of December 31, 2016. The remainder of such awards vest in two equal installments on March 31, 2017 and March 31, 2018.
- (5) Grant date is February 10, 2014.
- (6) Grant date is February 17, 2015.
- (7) Grant date is February 16, 2016.
- (8) Grant date is May 19, 2014. The remaining RSUs will vest on March 31, 2017.

- (9) Grant date is May 19, 2015. The remaining RSUs will vest in two equal installments on March 31, 2017 and March 31, 2018.
- (10) Grant date is May 31, 2016.
- (11) Grant date is May 31, 2016. These RSUs vest in three annual installments as follows: 20% vest on February 15, 2017, 30% on February 15, 2018 and 50% on February 15, 2019, however if February 15th is not a business day in any vesting year, such vesting shall occur on the next business day.
- (12) Grant date is July 5, 2016. These RSUs vest in two equal annual installments in June 2017 and June 2018, subject to the achievement of performance criteria determined in June 2017 and June 2018.

Option Exercises and Stock Vested in Fiscal Year 2016

| Name | Option Awards | | Stock Awards(1) | |
|-------------------|---|--------------------------------|---|---------------------------------|
| | Number of Shares Acquired on Exercise (#) | Value Realized on Vesting (\$) | Number of Shares Acquired on Vesting #(1) | Value Realized on Vesting \$(2) |
| Gerald G. Colella | | | 53,446 | \$1,759,773 |
| Seth H. Bagshaw | | | 28,544 | \$ 938,700 |
| John T.C. Lee | | | 18,944 | \$ 625,042 |
| Brian C. Quirk | | | 13,651 | \$ 448,786 |
| Dennis L. Werth | 5,838(3) | \$211,219(4) | | |

- (1) Reflects the gross number of shares vested before the surrender of shares in satisfaction of tax withholding obligations.
- (2) Reflects the gross value realized before satisfaction of tax withholding obligations.
- (3) Reflects the gross number of shares for which a stock-settled appreciation right was exercised, which exercise and settlement resulted in a net number of 3,738 shares being issued, representing the number of shares having an aggregate value equal to the difference between the base value of the stock appreciation right and our stock price at the time of exercise.
- (4) Reflects the gross value realized upon the exercise of stock-settled stock appreciation rights before satisfaction of tax withholding obligations.

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) upon 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 vest 80%, 90% and 100% at the ages of 60, 61 and 62, respectively.

The table below sets forth the present value as of December 31, 2016 of the accumulated benefits under Mr. Colella's supplemental pension arrangement. None of our other Named Executive Officers are eligible for supplemental retirement benefits.

PENSION 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 | \$11,480,223 | - |
| Seth H. Bagshaw | N/A | N/A | N/A | N/A |
| John T.C. Lee | N/A | N/A | N/A | N/A |
| Brian C. Quirk | 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 1.50%, a maturity value rate of 2.50% and salary increases of 3.0% 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 80% of the amount set forth above as of December 31, 2016.

Non-Qualified Deferred Compensation

The table below sets forth certain information relating to Mr. Werth's participation in Newport Corporation's Deferred Compensation Plan during the year ended December 31, 2016, 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 of December 31, 2016. In 2016, Mr. Werth did not make any contributions to, or withdrawals or received 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 we expect that these employees, including Mr. Werth, will have the opportunity to make an election to defer their 2017 annual incentive compensation to the extent earned and paid in 2018. We expect that after this election, no further elections will be 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 | - | - | \$2,114 | - | \$256,029 |

- (1) The aggregate earnings in 2016 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, 2016 consists of amounts contributed to the plan in prior years 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, 2016, under the circumstances set forth below.

Mr. Colella

On October 22, 2013, in connection with Mr. Colella's appointment as Chief Executive Officer and President, we entered into a new employment agreement with him, effective as of January 1, 2014, (the "Employment Agreement") which superseded his previous employment agreement dated April 25, 2005, as amended. Below is a summary of the material terms of Mr. Colella's Employment Agreement.

Under the Employment Agreement, 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 100% (which was subsequently increased by our Compensation Committee to 105%) 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 a one-year continuation of each of the following: base salary, payment of any annual cash incentive plan bonus earned for the prior calendar year but not yet paid, reimbursement for premiums he pays (if any) for continuation of life insurance if he elects the Company's group life insurance conversion feature, and payment for continuation of medical, dental or vision insurance. Payment of such benefits is conditioned upon execution of a release by Mr. Colella and his full compliance with the restrictive covenants described below.

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 of a change-in-control, Mr. Colella will receive a lump sum payment equal to 36 months of his base salary and 36 months of the target 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 as were provided under his original employment agreement, which was superseded by the Employment Agreement. 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 (defined as 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 Mr. Colella's surviving spouse in the event of Mr. Colella's death. The benefits for Mr. Colella vest 80%, 90% and 100% in the event of Mr. Colella's voluntary retirement at the ages of 60, 61 and 62, respectively. 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.

The Employment Agreement also continues to provide Mr. Colella and his spouse with the same retiree medical benefits as were provided under his original employment agreement. Accordingly, 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. Retirement, in this context, for RSUs awarded prior to 2015, means a voluntary termination of employment by the executive after he is at least age 60 and has a combination of years of age plus years of service (full years of employment since the executive's original hire date with the Company or one of its subsidiaries) with us equal to 70 or more. Retirement, in this context for RSUs awarded in 2015 and after, 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.

For purposes of the foregoing description of Mr. Colella's benefits under his Employment Agreement, "cause" means that the executive 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 positions, 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.

Potential Payments Upon Termination or Change-in-Control — 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, 2016.

| Termination Circumstance | 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) | Total |
|--|----------------|-------------|--------------------------------------|-----------------------|-------------------------------------|--|--------------|
| | Base Salary | Bonus | | | | | |
| Involuntary Without Cause Termination | \$800,000 | N/A | N/A | \$26,059(3) | \$13,207,931 | N/A | \$14,033,990 |
| Retirement(4) | N/A | N/A | \$8,443,774 | - | \$10,566,345 | N/A | \$19,010,119 |
| Death(4) | N/A | N/A | \$8,443,774 | \$274,189(5) | \$6,603,966 | N/A | \$15,321,929 |
| Disability(4) | N/A | N/A | \$8,443,774 | \$564,198(5) | \$13,207,931 | N/A | \$22,215,903 |
| Within 24 Months Following a Change-in-Control: | | | | | | | |
| • Termination by the Company Without Cause(6) | \$2,400,000 | \$2,520,000 | \$8,443,774 | \$583,998(7) | \$13,207,931 | \$857,031 | \$28,012,734 |
| • Executive Resignation for Good Reason(6) | \$2,400,000 | \$2,520,000 | \$8,443,774 | \$583,998(7) | \$13,207,931 | \$857,031 | \$28,012,734 |
| Between 24 Months and 36 Months Following a Change-in-Control: | | | | | | | |
| • Termination by the Company Without Cause | \$800,000 | N/A | N/A | \$570,798(8) | \$13,207,931 | - | \$14,578,729 |
| • Executive Resignation for Good Reason | N/A | N/A | N/A | \$564,198(5) | \$13,207,931 | - | \$13,772,129 |

- (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, medical, dental and vision coverage for 12 months following involuntary without cause termination, assuming the termination occurred on December 31, 2016.
- (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, 2016 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, 2016.
- (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, \$564,198, plus our cost for continuation of life insurance for 36 months following termination of employment, \$19,800, assuming the termination occurred on December 31, 2016.
- (8) This amount represents the estimated present value of retiree health benefits, \$564,198, plus our cost for continuation of life insurance for 12 months following termination of employment, \$6,600, assuming the termination occurred on December 31, 2016.

Other Named Executive Officers

Following our acquisition of Newport, we entered into new employment agreements with Messrs. Bagshaw, Lee, Quirk and Werth, each dated as of August 1, 2016. Under these employment agreements, in addition to his base salary, 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 employee fails to perform his duties or commits any other act constituting cause (as defined below). In the event that the officer resigns from the Company or is terminated by the Company without cause, subject to certain procedural requirements, the Company will pay such officer 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. Additionally, in the event that we terminate the executive's employment without cause, each executive officer 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 Waiver Award will become vested in full (if not already fully vested) as of the effective date of such termination.

In the event that such officer's employment is terminated without cause, or is terminated by the executive officer for good reason (as defined below) within 24 months after a change-in-control (as defined in the applicable agreement) each executive officer 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 incentive compensation for which such officer is eligible, or two times the annual amount of his 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 officer elects to continue coverage, payment by the Company of its usual share of premiums for medical, vision or 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 foregoing amounts results in receipt by Messrs. Bagshaw, Lee, Quirk 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. Messrs. Bagshaw, Lee, Quirk and Werth are not entitled to any gross-up payment for any such excise tax due.

The employment agreements of Messrs. Bagshaw, Lee and Quirk contain non-competition provisions that provide that each executive officer 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 Messrs. Bagshaw, Lee and Quirk 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 entered into a non-solicitation agreement with Newport; 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 Messrs. Bagshaw, Lee and Quirk 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 officer 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 Messrs. Bagshaw, Lee and Quirk 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, for RSUs awarded prior to 2015, means a voluntary termination of employment by the executive officer after he is at least age 60 and has a combination of years of age plus years of service (full years of employment since the executive officer's original hire date with the Company or one of its subsidiaries) with us equal to 70 or more. Retirement, in this context for RSUs awarded in 2015 or after, 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 executive officers typically vest in three equal annual installments, and 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 for Mr. Werth, 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 Messrs. Bagshaw, Lee, Quirk and Werth, "cause" will exist if the officer: (i) commits a felony or engages in fraud, misappropriation or embezzlement, (ii) knowingly fails or refuses to perform such officer'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 officer 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 officer's employment agreement, the confidential information agreement or any other agreement between such officer 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 officer in writing of the breach.

For purposes of the foregoing description of benefits under the employment agreements with Messrs. Bagshaw, Lee, Quirk and Werth, subject to compliance with certain procedural requirements, "good reason" for the applicable officer to resign will exist if, without such officer's express written consent: (i) the Company materially reduces such officer's position, duties or responsibilities, (ii) the Company reduces such officer's base salary as in effect on the date hereof or as the same may be increased from time to time during the term of the applicable employment agreement, or (iii) the Company changes such officer's principal place of work to a location more than 50 miles from such officer's current principal place of work.

Under the RSU agreements for Messrs. Bagshaw, Lee and Quirk, "cause" and "good reason" are the same as defined under Mr. Colella's RSU agreements.

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

The following table sets forth the estimated benefits that each Named Executive Officer, other than Mr. Colella, would have been entitled to receive upon termination of his employment effective December 31, 2016.

| Termination Circumstance | Cash Severance | | Value of Accelerated Unvested Equity | Benefits Continuation | Total |
|---|----------------|-----------|--------------------------------------|-----------------------|-------------|
| | Base Salary | Bonus | | | |
| Involuntary Without Cause Termination: | | | | | |
| Seth H. Bagshaw | \$277,083 | - | - | - | \$ 277,083 |
| John T. C. Lee | \$291,667 | - | - | - | \$ 291,667 |
| Brian C. Quirk | \$218,750 | - | - | - | \$ 218,750 |
| Dennis L. Werth | \$233,333 | - | \$ 554,400(1) | \$ 1,672(2) | \$ 789,405 |
| Within 24 Months Following a Change-in-Control: | | | | | |
| Seth H. Bagshaw | \$950,000 | \$760,000 | \$3,815,012(3) | \$65,080(4) | \$5,590,092 |
| John T. C. Lee | \$750,000 | \$675,000 | \$2,882,211(3) | \$56,636(4) | \$4,363,847 |
| Brian C. Quirk | \$562,500 | \$337,500 | \$1,748,211(3) | \$56,192(4) | \$2,704,403 |
| Dennis L. Werth | \$600,000 | \$450,000 | \$ 554,400(3) | \$30,095(4) | \$1,634,495 |
| Death or Disability: | | | | | |
| Seth H. Bagshaw | - | - | \$3,815,012(5) | - | \$3,815,012 |
| John T. C. Lee | - | - | \$2,882,211(5) | - | \$2,882,211 |
| Brian C. Quirk | - | - | \$1,748,211(5) | - | \$1,748,211 |
| Dennis L. Werth | - | - | \$1,745,763(5) | - | \$1,745,763 |
| Retirement: | | | | | |
| Seth H. Bagshaw | - | - | -(6) | - | - |
| John T. C. Lee | - | - | -(6) | - | - |
| Brian C. Quirk | - | - | -(6) | - | - |
| Dennis L. Werth | - | - | -(6) | - | - |

- (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 policy in effect as of December 31, 2016 and continuation under the federal COBRA program, and reflects reimbursement for 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 Messrs. Bagshaw, Lee and Quirk, the unvested time-based RSUs fully vest and the target number of unvested performance-based RSUs vest. The unvested time-based RSUs subject to Mr. Werth's Waiver Award fully vest.
- (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, 2016.
- (5) Upon death or disability, RSUs for Messrs. Bagshaw, Lee and Quirk fully vest, subject to achievement of any remaining performance criteria. With respect to Mr. Werth, upon death or disability, RSUs awarded in May 2016 fully vest, subject to achievement of any remaining performance criteria. The stated value assumes the death or disability occurred on December 31, 2016 and assumes the target number of unvested performance-based RSUs vested.
- (6) Upon retirement (as defined in the RSU agreements), RSUs for Messrs. Bagshaw, Lee and Quirk fully vest, subject to achievement of any remaining performance criteria. However, because Messrs. Bagshaw, Lee and Quirk were not age 60 as of December 31, 2016, they did not qualify for retirement at that time. Mr. Werth's RSU agreements do not provide for acceleration of vesting upon retirement.

Equity Compensation Plan Information

The following table provides information about the securities authorized for issuance under our equity compensation plans as of December 31, 2016:

| <u>Plan Category</u> | <u>Number of securities to be issued upon exercise of outstanding options, warrants and rights(1)</u> (a) | <u>Weighted-average exercise price of outstanding options, warrants and rights</u> (b) | <u>Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a))</u> (c) |
|--|--|---|---|
| Equity compensation plans approved by security holders | 1,924,850(2) | 28.10(3) | 17,444,333(4) |
| Equity compensation plans not approved by security holders | - | - | - |
| Total | 1,924,850(2) | | 17,444,333(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 (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 (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, 2016, 17,648 were held in the Deferred Compensation Plan for the benefit of such awardees.
- (2) As of December 31, 2016, the number of shares reflected in column (a) consists of: (i) assumed SARs with respect to an aggregate of 599,334 shares of our Common Stock, (ii) assumed RSUs with respect to 269,696 shares of our Common Stock and (iii) RSUs representing the right to receive an aggregate of 1,055,820 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 restricted stock units were awarded without payment of any purchase price.
- (4) This number includes 15,306,424 shares available for issuance under our 2014 Stock Incentive Plan and 2,137,909 shares reserved for issuance under our 2014 Employee Stock Purchase Plan. Shares issued under our 2014 Stock Incentive Plan in respect of restricted stock units, 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.

DIRECTOR COMPENSATION

Cash Compensation

The following table summarizes cash compensation payable by us to non-employee directors with respect to the period from January 1, 2016 through June 30, 2016:

| | Annual Retainer |
|---|------------------------|
| Base Retainer for All Non-Employee Board Members | \$52,000 |
| <i>Additional Retainers for Services:</i> | |
| Chairman | \$43,000 |
| Lead Director | \$18,000 |
| Audit Committee Chair | \$20,000 |
| Other Audit Committee Members | \$10,000 |
| Compensation Committee Chair | \$15,000 |
| Other Compensation Committee Members | \$ 7,500 |
| Nominating and Corporate Governance Committee Chair | \$10,000 |
| Other Nominating and Corporate Governance Committee Members | \$ 5,000 |

In August 2016, the Board of Directors, upon the recommendation of the Compensation Committee, approved several changes to the non-employee director cash compensation program. The new cash compensation program became effective July 1, 2016. The following table summarizes cash compensation payable by us to non-employee directors with respect to the period from July 1, 2016 to December 31, 2016:

| | Annual Retainer |
|---|------------------------|
| Base Retainer for All Non-Employee Board Members | \$60,000 |
| <i>Additional Retainers for Services:</i> | |
| Chairman | \$45,000 |
| 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 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 2016, under our director compensation program, non-employee directors received automatic grants of RSUs on the date of the Annual Meeting of Shareholders, with a grant date value of \$140,000, 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). In August 2016, the Board of Directors, upon the recommendation of the Compensation Committee, increased the value of the annual RSU grant to \$160,000 per non-employee director, effective on the date of the 2017 Annual Meeting of Shareholders.

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 \$293,994 as of December 31, 2016. 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 \$201,468 as of December 31, 2016. Mr. Bertucci receives no other retirement benefits.

The following table summarizes compensation paid to non-employee directors in 2016. Mr. Colella is excluded from the table because he is an executive officer, and his compensation is set forth in the Executive Compensation section above, under the heading “Executive Compensation — Summary Compensation Table for 2016.”

Director Compensation Table for 2016

| Name | Fees Earned or Paid in Cash (\$) | Stock Awards \$(1) | All Other Compensation (\$) | Total (\$) |
|--------------------------|--|--------------------------|-----------------------------------|---------------|
| Cristina H. Amon(2) | \$ 21,795 | \$ - | \$ - | \$ 21,795 |
| Robert R. Anderson | \$ 85,750 | \$ 140,000 | \$ - | \$ 225,750 |
| Gregory R. Beecher | \$ 101,500(3) | \$ 140,000 | \$ - | \$ 241,500 |
| John R. Bertucci | \$ 104,000(3) | \$ 140,000 | \$ 34,489(4) | \$ 278,489 |
| Richard S. Chute | \$ 67,250 | \$ 140,000 | \$ - | \$ 207,250 |
| Peter R. Hanley | \$ 69,000 | \$ 140,000 | \$ - | \$ 209,000 |
| Jacqueline F. Moloney(5) | \$ 42,146 | \$ 140,000 | \$ - | \$ 182,146 |
| Elizabeth A. Mora | \$ 72,466 | \$ 140,000 | \$ - | \$ 212,466 |
| Robert J. Phillippy(6) | \$ 30,000 | \$ 140,000 | \$ 205,569(7) | \$ 375,569 |

- (1) Represents the grant date fair value for each RSU granted during the year, calculated in accordance with ASC 718. The assumptions used in determining the grant date fair values of these awards are set forth in Note 18 to our consolidated financial statements, which are included in our Annual Report on Form 10-K filed with the SEC on March 1, 2017. Ms. Amon did not hold any stock awards as of December 31, 2016. The outstanding stock awards held as of December 31, 2016 by each of the other non-employee directors consisted entirely of RSUs. Each non-employee director, other than Mr. Phillippy, held 3,832 RSUs and Mr. Phillippy held 3,287 RSUs.
- (2) Ms. Amon served as a director until May 2016.
- (3) Includes \$4,000 in consideration for services on a special committee of the Board of Directors, which was 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 \$14,625 for this benefit in 2016. We paid \$19,864 for Mr. Bertucci’s car allowance in 2016.
- (5) Ms. Moloney became a director in May 2016.
- (6) Mr. Phillippy became a director in July 2016.
- (7) In connection with the Newport acquisition, Mr. Phillippy, former President and Chief Executive Officer of Newport, remained employed by Newport from the closing on April 29, 2016 through July 1, 2016 and served as a consultant from July 2, 2016 through September 30, 2016, in order to assist with the integration

of Newport's business. For the period he remained an employee of Newport after the acquisition, he was compensated in accordance with his compensatory arrangements prior to the acquisition and he earned \$115,569. For the three month period he served as a consultant, he was paid \$30,000 per month. Also, in consideration of Mr. Phillippy's agreement to support our integration efforts, on May 2, 2016, we accelerated in full the vesting of Mr. Phillippy's RSUs and stock appreciation rights, which would have otherwise accelerated as of July 1, 2016.

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 relation 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, who 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 (collectively, the "Wellington Group") collectively beneficially owned approximately 10% of the Company's outstanding voting shares, as of December 31, 2016, according to filings they have made with the SEC. Wellington Management LLC ("Wellington Management"), an affiliate of the Wellington Group, manages cash accounts of MKS, in the aggregate amount of approximately \$192 million as of December 31, 2016. In 2016, MKS paid Wellington Management approximately \$255,000 for these cash management services. Wellington Management 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.

REPORT OF THE AUDIT COMMITTEE OF THE BOARD OF DIRECTORS

The Audit Committee of our Board of Directors has reviewed our audited financial statements for the year ended December 31, 2016 and discussed them with our management.

The Audit Committee has also received from, and discussed with, PricewaterhouseCoopers LLP, 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. 16, *Communications with Audit Committee*.

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 their 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, 2016.

Respectfully submitted,

Gregory R. Beecher, Chair
Robert R. Anderson
Elizabeth A. Mora

**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.

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.

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" above for additional details about our executive compensation philosophy and programs, including information about the compensation of our Named Executive Officers for the 2016 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.

PROPOSAL THREE

ADVISORY VOTE REGARDING FREQUENCY OF ADVISORY VOTES ON EXECUTIVE COMPENSATION

We are also asking shareholders to cast a non-binding, advisory vote on whether an advisory vote to approve the compensation of our Named Executive Officers as described in Proposal Two above (“say-on-pay vote”) should take place every three years, every two years or every year.

Currently, a say-on-pay vote is submitted to our shareholders every year. The advisory vote on the frequency of the say-on-pay vote is a non-binding vote as to how often the say-on-pay vote should occur: every year, every two years, or every three years. Section 14A of Exchange Act requires us to submit a non-binding advisory vote on the frequency of the say-on-pay vote at least once every six years to determine whether advisory votes on executive compensation, such as Proposal Two, should be held every one, two or three years. On May 2, 2011, we held an annual meeting of shareholders at which shareholders voted on, among other matters, a non-binding proposal regarding the frequency of future say-on-pay votes. A majority of the votes cast on the frequency proposal were cast in favor of holding annual say-on-pay votes, and after considering the voting results, our Board of Directors decided to conduct an advisory vote on the compensation of our Named Executive Officers on an annual basis until the next advisory vote on the frequency of such say-on-pay votes.

After careful consideration, our Board of Directors has determined that a non-binding, advisory vote on executive compensation that occurs on an annual basis continues to be the most appropriate alternative for the Company, and therefore our Board of Directors recommends that shareholders approve continuing to hold the advisory vote on the compensation of our Named Executive Officers every year.

In formulating its recommendation, our Board of Directors considered that an annual say-on-pay vote will allow our shareholders to provide us with their direct input on our compensation philosophy, policies and practices as disclosed in our proxy statement every year. While the Company currently recommends a vote in favor of an annual vote, you may cast your vote on your preferred voting frequency by choosing the option of one year, two years, three years or abstaining from voting when you vote on this proposal. However, because this vote is advisory and non-binding, the Board of Directors may decide that it is in the best interests of our shareholders and the Company to hold a say-on-pay vote more or less frequently than the option approved by our shareholders.

THE BOARD OF DIRECTORS BELIEVES THAT HAVING AN ADVISORY VOTE TO APPROVE EXECUTIVE COMPENSATION ONCE EVERY YEAR IS IN THE BEST INTERESTS OF MKS AND OUR SHAREHOLDERS AND THEREFORE RECOMMENDS THAT SHAREHOLDERS VOTE “FOR” AN ADVISORY VOTE ON EXECUTIVE COMPENSATION ONCE EVERY YEAR.

PROPOSAL FOUR

RATIFICATION OF APPOINTMENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Our Audit Committee has appointed PricewaterhouseCoopers LLP, or PwC, as the Company’s independent registered public accounting firm for the fiscal year ending December 31, 2017. PwC was our independent registered public accounting firm for the fiscal year ended December 31, 2016.

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 appointment 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 APPOINTMENT OF PWC AS OUR INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM FOR THE FISCAL YEAR ENDING DECEMBER 31, 2017 IS IN THE BEST INTERESTS OF MKS AND OUR SHAREHOLDERS AND THEREFORE RECOMMENDS A VOTE “FOR” THIS PROPOSAL.

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.

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.

INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

For the years ended December 31, 2016 and 2015, aggregate fees for professional services rendered by our independent registered public accounting firm, PwC, in the following categories were as follows:

| | <u>2016</u> | <u>2015</u> |
|--------------------|---------------------|---------------------|
| Audit Fees | \$ 4,196,230 | \$ 1,984,592 |
| Audit-Related Fees | 607,934 | - |
| Tax Fees | 692,792 | 345,000 |
| All Other Fees | 1,800 | 1,800 |
| Total | <u>\$ 5,498,756</u> | <u>\$ 2,331,392</u> |

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 control over financial reporting as required by the rules and regulations promulgated under Section 404 of the Sarbanes-Oxley Act of 2002.

Audit-Related Fees

Audit-related fees for the year ended December 31, 2016 were for due diligence services performed in connection with our acquisition of Newport Corporation. There were no audit-related fees for the year ended December 31, 2015.

Tax Fees

Tax Fees for the year ended December 31, 2016 were for services related to tax planning and tax advice, including assistance with foreign operations and foreign tax audits, and for services related to our acquisition of Newport Corporation, which was consummated in April 2016. Tax Fees for the year ended December 31, 2015 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, 2016 and 2015 were for accounting research software.

In 2016 and 2015, all Audit Fees, Audit-Related Fees, Tax Fees and All Other Fees were pre-approved pursuant to the Audit Committee 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.

DEADLINE FOR SUBMISSION OF SHAREHOLDER PROPOSALS FOR THE 2018 ANNUAL MEETING

Proposals of shareholders intended to be presented at the 2018 Annual Meeting of Shareholders must be received by us at our principal office in Andover, Massachusetts not later than December 1, 2017 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 (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. 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.

IMPORTANT NOTICE REGARDING DELIVERY OF SECURITY HOLDER DOCUMENTS

Some banks, brokers and other nominee record holders are currently "householding" proxy statements and annual reports. This means that only one copy of our proxy statement or annual report may have been sent to multiple shareholders in your household. We will promptly deliver a separate copy of either document to you if

you call or write us at the following address or phone number: **MKS Instruments, Inc., 2 Tech Drive, Suite 201, Andover, Massachusetts 01810, Attn: Investor Relations or (800) 227-8766**. You may also access our proxy statement and related materials at investor.mksinst.com/annualproxy.cfm. If you want to receive separate copies of the annual report and proxy statement in the future, or if you are receiving multiple copies and would like to receive only one copy for your household, you should contact your bank, broker, or other nominee record holder, or you may contact us at the above address and phone number.

By Order of the Board of Directors,

RICHARD S. CHUTE
Secretary

March 24, 2017

THE BOARD OF DIRECTORS ENCOURAGES SHAREHOLDERS TO ATTEND THE ANNUAL MEETING. WHETHER OR NOT YOU PLAN TO ATTEND, YOU ARE URGED TO COMPLETE, DATE, SIGN AND RETURN THE ENCLOSED PROXY IN THE ACCOMPANYING ENVELOPE. A PROMPT RESPONSE WILL GREATLY FACILITATE ARRANGEMENTS FOR THE MEETING AND YOUR COOPERATION WILL BE APPRECIATED. SHAREHOLDERS WHO ATTEND THIS MEETING MAY VOTE THEIR STOCK PERSONALLY EVEN THOUGH THEY HAVE SENT IN THEIR PROXIES.

Important Notice Regarding the Availability of Proxy Materials for the 2017 Annual Meeting: The Annual Report, Notice & Proxy Statement are available at www.proxyvote.com.

**MKS INSTRUMENTS, INC.
2017 Annual Meeting of Shareholders
May 10, 2017 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 2017 Annual Meeting of Shareholders and Proxy Statement, each dated March 24, 2017, and hereby appoints Gerald G. Colella, Richard S. Chute 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 2017 Annual Meeting of Shareholders of the Company to be held on May 10, 2017 at 10:00 AM, local 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.

This proxy, when properly executed, will be voted as directed on the reverse side, or, if no direction is indicated, will be voted FOR the election of each of the three (3) nominees listed on the reverse side as Class III Directors of the Company, FOR proposals 2 and 4, 1 year on proposal 3 and as said proxies deem advisable, in their discretion, on such other matters as may properly come before the meeting.

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

mks
MKS Instruments, Inc.
2 TECH DRIVE
SUITE 201
ANDOVER, MA 01810

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 the day before the cut-off date or meeting date. 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.

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 receiving 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 above to vote using the Internet and, when prompted, indicate that you agree to receive or access proxy materials electronically in future years.

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 the day before the cut-off date or meeting date. 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 three nominees listed below as Class III Directors, each to serve for a three-year term:

Nominees

01 John R. Bertucci 02 Gregory R. Beecher 03 Rick D. Hess

- 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 1 YEAR on the following proposal:

3. An advisory vote regarding the frequency of advisory votes on executive compensation.

1 Year **2 Years** **3 Years** **Abstain**

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

4. The ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for the year ending December 31, 2017.

For **Against** **Abstain**

NOTE: Such other business as may properly come before the meeting or any adjournment thereof.

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) hereon. When signing as attorney, executor, administrator, or other fiduciary, please give full title as such. Joint owners should each sign personally. All holders must sign. If a corporation or partnership, please sign in full corporate or partnership name by authorized officer.

| | |
|-----------------------------------|------|
| Signature[PLEASE SIGN WITHIN BOX] | Date |
|-----------------------------------|------|

| | |
|-------------------------|------|
| Signature(Joint Owners) | Date |
|-------------------------|------|