

September 30, 2015

U.S. Nuclear Regulatory Commission  
Office of Nuclear Material Safety and Safeguards  
11545 Rockville Pike  
Two White Flint Building  
Mailstop 2WF-04D46  
Rockville, Maryland 20852  
Attention: Tyrone Naquin

**Via Federal Express**

Re: Compliance Submissions, Self- Guarantee Agreement Pursuant to 10 CFR Part 50, 10 CFR Part 70 and NUREG-1757, Vol.3

Dear Mr. Naquin:

In my capacity as the Executive Vice President and Treasurer of the Massachusetts Institute of Technology ("MIT"), a nonprofit university, I serve as MIT's Chief Financial Officer. This letter is in support of MIT's use of the self-guarantee financial test to demonstrate financial assurance, as specified in 10 CFR Part 70 and 10 CFR Part 72, as ongoing compliance with MIT's Self-Guarantee Agreement, dated May 3, 2010 (the "Agreement"), and approved by the Nuclear Regulatory Commission on July 16, 2010.

In order to demonstrate ongoing compliance with the Agreement and 10 CFR Part 70 and 10 CFR Part 72, and MIT's ability to self-guarantee the decommissioning of the following facilities owned or operated by MIT, the current cost estimates or certified amounts for decommissioning each facility, so guaranteed, are shown below, along with their calculation (if applicable), and supporting attachments are enclosed:

<u>Name of Facility</u>	<u>License Number</u>	<u>Location of Facility</u>	<u>Certified Amounts or Current Cost Estimates</u>
MIT	SNM-986	77 Massachusetts Ave. Cambridge, MA 02139	\$1,125,000.00
MIT Research Reactor R-37		138 Albany St. Cambridge, MA 02139	\$35,687,000.00

## A. License No. SNM-986

Based upon the applicable quantities of special nuclear materials stored at this facility, in accordance with 10 C.F.R. 70.25(d), MIT must guarantee the statutory minimum of \$1,125,000 for the proper disposal of these materials.

## B. License No. R-37

1. Justification for 2005 \$23M Decommissioning Estimate:

Duke Engineering provided MIT with a cost estimate of \$23.0M. That study was completed in November 2001. It included a 10% contingency. Inflation was quite low and for some sectors of the economy slightly negative for the years 2001-2005. Accordingly, for our 2006 submittal, we used the uninflated detailed Duke estimate which was \$23.0M. For 2008, we provided an estimate of \$29.8 million, based on separate inflation factors applied against the labor costs, using the NUREG-1307, Rev. 12, Page D.1, Example 2, (Northeast Region) of 1.40 (labor) and 1.72 (burial).

2. Decommissioning Estimate for 2016:

For 2016, we estimate the decommissioning cost of the MIT Reactor to be \$35.7 million. This figure is obtained by taking the \$23.0M Duke estimate as a base and inflating it for both the cost of labor and burial as shown below:

Duke Study	23,000,000	%Total	NUREG Inflation Model	Inflator	35,687,000.00
Labor Portion	20,470,000	89%	Labor	1.4947	30,597,000.00*
Burial Portion	2,530,000	11%	Burial	2.0118	5,090,000.00*

Please note that labor was 89% of the total estimate and burial was 11%. The inflator figures are obtained from NUREG-1307, Rev. 15, Page D.1, Example 2 (Appendix D). We take the date of completion of the Duke study to be 2002 as this is closest to the actual date of November 2001. For labor, the cost index is 2.52 in 2012 and 1.862 for 2002. We assume that cost increases are linear through 2016 and obtain:

$$(1.862 + ((2.52 - 1.862) / (2012 - 2002))(2016 - 2002)) = 2.7832$$

The inflation factor for 2016 as compared to 2002 is therefore 2.7832/1.862 or 1.4947. Hence, the labor portion of the cost is (\$20.5M) (1.4947) or \$30.597 million. For burial, the same approach is used to yield a factor of 36.0548, an inflation factor of 2.0118 and a cost of \$5.09 million (\*Please refer to Attachment 1 – Calculations adjusted due to rounding.).

I hereby certify that MIT is currently a going concern, and that it possesses positive tangible net worth in the amount of \$17.7 billion, as of the fiscal year ending on June 30, 2015. This figure is derived from MIT's independently audited, year-end financial statements and footnotes for the latest completed fiscal year, which is enclosed. MIT's independent auditor, PricewaterhouseCoopers, has included its review of this letter, which is also enclosed.

MIT is not required to file a Form 10-K with the U.S. Securities and Exchange Commission for the latest fiscal year.

MIT satisfies the following self-guarantee test:

1. Current bond rating of most recent uninsured, uncollateralized, and unencumbered issuance of this institution:

Rating: AAA

Name of rating service: Standard & Poor's Financial Services LLC

2. Date of issuance of bonds: September 29, 2014

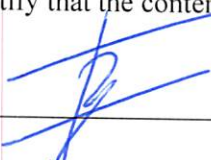
3. Description and date of maturity of bonds:

Amount	Interest Rate	Maturity Date	Description
\$66,410,000	2.051%	July 1, 2119	Taxable Series D1
\$86,000,000	3.308%	July 1, 2026	Taxable Series D1
\$370,000,000	3.959%	July 1, 2038	Taxable Series D2

4. Is the rating specified on line 1 "A" or better? Yes

I hereby certify that the content of this letter is true and correct to the best of my knowledge.

Signature



Name: Israel Ruiz

Title: Executive Vice President and Treasurer  
(Chief Financial Officer)

Date: OCTOBER 1, 2015

Enclosures



## Report of Independent Accountants

To the Corporation of  
Massachusetts Institute of Technology:

We have performed the procedures included in the Consolidated NMAA Decommissioning Guidance – Financial Assurance, Recordkeeping, and Timeliness (NUREG-1757, Volume 3, Revision 1, Appendix A) and enumerated below, which were agreed to by management of Massachusetts Institute of Technology ("the Institute"), solely to assist you in evaluating the Institute's compliance with the Nuclear Regulatory Commission's financial assurance regulations, 10 CFR Part 70 and 72 with respect to NRC MIT licenses SNM-986 and R-37. Management is responsible for the Institute's compliance with those regulations. This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures described below either for the purpose for which this report has been requested or for any other purpose.

The procedures and associated findings performed in relation to the CFO's Letter dated September 30, 2015 are as follows:

1. We confirmed that the total tangible net worth in the CFO's Letter agrees with total net assets contained in the Institute's financial statements for the year ended June 30, 2015, which we have audited in accordance with auditing standards generally accepted in the United States of America and have issued our report thereon dated September 11, 2015. A tie-out of the financial statements to the CFO's Letter is shown in the accompanying schedule to this report.
2. We inquired of management as to the existence of any reconciling items between the CFO's Letter and the audited financial statements noting that there are none;
3. We mathematically checked the totals in the accompanying schedule and recomputed the current cost estimates of decommissioning for each facility listed per the CFO's Letter.
4. We compared the bond ratings in the CFO's Letter to the information obtained from external, publically available source as follows:

Rating per the CFO's Letter	Rating per External Source	External Source
AAA	AAA	<a href="http://www.standardandpoors.com">www.standardandpoors.com</a>

5. A requirement in 10 CFR 30 App E I.L.C.(1) is the accountant must evaluate the licensee's off-balance sheet transactions and provide an opinion on whether those transactions could materially adversely affect the licensee's ability to pay for decommissioning costs. However, the guidelines



established by the American Institute of Certified Public Accountants (AICPA) prohibit an accountant from rendering an opinion of the type required by the regulation cited above. As a result, we have inquired of management as to the existence of any off-balance sheet arrangements. Management provided us with a schedule of all known off-balance sheet arrangements totaling \$2,408,450,000 as of June 30, 2015. We recalculated the total figure of off-balance sheet arrangements for mathematical accuracy. We also confirmed that the total of the all known off-balance sheet arrangements included in the schedule provided by management is less than the tangible net worth reported in the CFO's Letter.

No exceptions were noted.

We were not engaged to and did not conduct an examination, the objective of which would be the expression of an opinion on compliance with the regulations. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the information and use of management and the Corporation of Massachusetts Institute of Technology and the Nuclear Regulatory Commission, and is not intended to be and should not be used by anyone other than these specified parties.

*PricewaterhouseCoopers LLP*

September 30, 2015



**Schedule for Reconciling Amounts Contained in  
Chief Financial Officer's  
Letter with Amounts in Financial Statements**

**Massachusetts Institute of Technology  
Year Ended June 30, 2015**

	<b>Per Financial Statements</b>	<b>Reconciling Items</b>	<b>Per CFO's Letter</b>
Total net worth	17,738,988		
Less: Cost in excess of value of tangible assets acquired	-		
	<u>17,738,988</u>		
Tangible net worth			17,738,988

**ATTACHMENT 1**

**NRC Decommissioning Estimate 2016**

<u>Duke Study (2002)</u>	<u>23,000,000.00</u>		<u>NRC Inflation Model 2016</u>	<u>Inflator</u>	<u>35,687,000.00</u>
Labor Portion	20,470,000.00	89%	Labor	1.4947	30,597,000.00
Burial portion	2,530,000.00	11%	Burial	2.0118	5,090,000.00

	<b>2006</b>	<b>2016</b>
<b>LABOR</b>	2.384	2.7832
	<b>1.28</b>	<b>1.4947</b>
<b>BURIAL</b>	25.4385	36.0548
	<b>1.42</b>	<b>2.0118</b>

**APPENDIX D. REPRESENTATIVE EXAMPLES OF DECOMMISSIONING COSTS FOR 2002 THROUGH 2012**

In Section 3.4 of this revision and the five previous revisions of NUREG-1307, decommissioning costs for four typical situations were developed. Results of these calculations are summarized below.

Example 1 (Low-Level Waste (LLW) Direct Disposal)

Reactor Type: Pressurized-Water Reactor (PWR)  
 Thermal Power Rating: 3400 Megawatt Thermal(MWth)  
 Location of Plant: Northwest Compact  
 LLW Burial Location: Washington

	<u>2002</u>	<u>2004</u>	<u>2006</u>	<u>2008</u>	<u>2010</u>	<u>2012</u>
L <sub>x</sub>	1.775	1.984	2.11	2.23	2.29	2.38
E <sub>x</sub>	0.985	1.483	2.152	2.746	2.139	2.704
B <sub>x</sub>	3.634	5.374	6.829	8.283	8.035	7.470
Decommissioning Cost (Millions)	\$219	\$280	\$331	\$381	\$371	\$372

Example 2 (LLW Direct Disposal)

Reactor Type: PWR  
 Thermal Power Rating: 3400 MWth  
 Location of Plant: Atlantic Compact  
 LLW Burial Location: South Carolina (Atlantic Compact)

	<u>2002</u>	<u>2004</u>	<u>2006</u>	<u>2008</u>	<u>2010</u>	<u>2012</u>
L <sub>x</sub>	1.862	2.070	2.21	2.33	2.41	2.52
E <sub>x</sub>	0.985	1.483	2.152	2.746	2.139	2.704
B <sub>x</sub>	17.922	19.500	22.933	25.231	27.292	30.874
Decommissioning Cost (Millions)	\$555	\$612	\$710	\$779	\$824	\$922



# RatingsDirect®

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## Massachusetts Institute of Technology; Private Coll/Univ - General Obligation

**Primary Credit Analyst:**

Jessica A Matsumori, San Francisco (1) 415-371-5083; [jessica.matsumori@standardandpoors.com](mailto:jessica.matsumori@standardandpoors.com)

**Secondary Contact:**

Nick Waugh, Boston (1) 617-530-8342; [nick.waugh@standardandpoors.com](mailto:nick.waugh@standardandpoors.com)

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# Massachusetts Institute of Technology; Private Coll/Univ - General Obligation

Credit Profile		
US\$525.0 mil GO rfdg bnds ser D-1 and D-2 due 07/01/2038		
<i>Long Term Rating</i>	AAA/Stable	New
<b>Massachusetts Development Finance Agency, Massachusetts</b>		
Massachusetts Inst of Tech, Massachusetts		
<b>Massachusetts Hlth &amp; Educl Facs Auth (Massachusetts Inst of Tech) ser K,L, I,N</b>		
<i>Long Term Rating</i>	AAA/Stable	Affirmed

## Rationale

Standard & Poor's Ratings Services assigned its 'AAA' long-term rating to the Massachusetts Institute of Technology (MIT) approximately \$525 million series D-1 and D-2 taxable general obligation (GO) refunding bonds. In addition, Standard & Poor's affirmed its 'AAA' long-term rating and 'AAA/A-1+' rating on MIT's existing debt, some of which was issued by the Massachusetts Development Finance Agency (formerly known as the Massachusetts Health and Educational Facilities Authority). The outlook on all ratings is stable.

The 'AAA' rating reflects our view of MIT's substantial endowment, incredible demand for its programs, growth in research, and consistently strong operating performance. This offsets our view of the Institute's lower-than-average financial resource ratios compared with the 'AAA' category and accelerated debt issuance compared to our original expectations. In our view, the university has made significant progress toward its strategic and capital plans. The Institute has also completed the work under the president's Institute-wide Task Force on the Future of MIT Education, which will inform current and future strategic and capital initiatives for the institution.

The 'A-1+' short-term rating reflects our view of MIT's general credit strengths and considerable experience in managing its own liquidity. MIT is providing its own liquidity to support its \$250 million of series J-1 (swapped to fixed rate) and J-2 variable-rate demand bonds (VRDBs). We believe MIT demonstrates sufficient liquid assets of high credit quality, largely in U.S. Treasuries, as well as a bank line that it can use, among other things, to cover the purchase price of VRDBs if any of the bonds are tendered but not successfully remarketed. Availability of liquid assets is sufficient, in our opinion, with same-day liquidity composed of high-quality U.S. government securities and cash. In our opinion, MIT has demonstrated the policies and procedures necessary to provide self-liquidity.

More specifically, the 'AAA' rating is supported by the Institute's:

- Status as a preeminent research Institute with over \$1.5 billion in research revenues in fiscal 2014;
- Strong and growing endowment and similar funds of \$12.42 billion as of June 30, 2014;
- Significant demand, excellent student quality, and increasingly competitive admissions; and
- Strong operating performance, supported by good revenue diversity and the demonstrated ability to raise funds.

Offsetting factors include our view of MIT's:

- Adequate financial resource ratios relative to peers with expendable resources of \$13.48 billion in fiscal 2014 equal to 4.2x operations and 4.6x debt;
- General uncertainty about the future of federal grant and research funding for the sector;
- Relatively high, but still manageable, debt levels with an uneven repayment structure and a moderate average annual debt burden of 5.9%; and
- Substantial capital and strategic plans and deferred maintenance needs, with possible additional debt plans in the next few years.

We expect the series D bonds will be used to advance refund a portion of the outstanding series N and O tax-exempt bonds and will be issued as taxable, fixed-rate obligations. As with MIT's existing debt, we expect the series D taxable bonds to be an unsecured general obligation of the Institute. Following this issuance, MIT will have a total of \$2.92 billion of long-term debt outstanding, including about \$177 million drawn under a \$500 million bank line of credit. We understand that the Institute uses this line opportunistically and periodically for various funding purposes. MIT's debt structure includes a number of bullet maturities, which make debt service quite uneven from year to year; fiscal 2014 debt service was \$162.4 million for an average debt burden of 5.1%. However, the Institute's maximum annual debt service (MADS) during the next 30 years is \$348 million, which is high, in our view, at 10.9% of fiscal 2014 adjusted operating expenses, while overall MADS of \$818 million (25.7% of fiscal 2014 expenses) for the organization's total debt occurs in 2111 at the maturation of its century bonds. If we assume level debt service and a 30-year financing term is assumed, estimated average annual debt service of the Institute's total debt (assuming a 30-year maturity, 5% interest rate, and even debt service) is approximately \$188 million, which we still consider moderate at 5.9% of fiscal 2014 expenses.

MIT remains conservative, in our opinion, in its use of variable-rate debt exposure, net of swaps, compared with its peers. Of the total pro forma debt, a small portion is variable rate (15% or \$427 million), and the largest portion is fixed rate (85%). All debt is an unsecured general obligation of MIT. In our opinion, MIT has adequate liquidity to fund its VRDBs.

In 2013, President Reif launched an Institute-wide "Task Force on the Future of MIT Education." As the Institute addresses the findings, initiatives, and strategy articulated by this task force, we anticipate MIT will devote over \$200 million per year toward capital projects and comprehensive stewardship of its facilities, will engage in robust fundraising efforts, and will issue up to an additional \$250 million of debt in the next few years. To better align with the needs of the task force, the Institute recently named a new chancellor, provost, vice president for research, vice president for international activities, and added a chancellor for academic advancement. In October 2014, John S. Reed will transition to Chairman Emeritus status, and Robert B. Millard will assume the position of Chairman of the MIT Corporation in accordance with the Institute's bylaws. The rest of the management and board of trustees is stable.

## Outlook

The stable outlook reflects our expectation that the MIT's extremely strong demand and financial operating performance will continue and that its robust fundraising will persist. We also expect financial resources will continue

to improve.

We would view negatively considerable deterioration of MIT's operating performance, an inability to meet its financial projections and objectives, or a dilution of financial resource measures relative to either operating expenses or debt during the next one to two years. We anticipate the university may issue up to an additional \$250 million outside the outlook period. As the exact size, timing, and purpose of this debt is still uncertain, we have not incorporated it into this rating. We will assess the effect of any additional debt on MIT's rating as those details become more defined.

## Economic Profile

### The Institute

MIT is a private, nonsectarian, coeducational, nonprofit institution of higher education. As of fall 2013, it had a total of 11,301 students, 6,639 or 60% of whom were full-time graduate students. MIT has over 1,000 faculty members and more than 4,000 other academic staff. The Institute is on a 168-acre-residential campus fronting the Charles River in Cambridge. MIT is organized into five schools and one college: architecture and planning; engineering; humanities, arts, and social sciences; management; science; and the Whitaker College of Health Sciences.

MIT is one of the pre-eminent research Institutes in the world, composed of major interdisciplinary organizations, as well as three off-campus research facilities in Massachusetts: Lincoln Laboratory in Lexington, Haystack Observatory in Tyngsborough, and the Bates Linear Accelerator Center in Middleton. MIT operates the Lincoln Laboratory as a federally funded research and development center focused on advanced electronics. In fiscal 2014, MIT's research activities were over \$1.5 billion in revenue, including campus, Lincoln Laboratory, and Singapore-MIT Alliance for Research and Technology (SMART). Research did decline slightly in fiscal 2014, in line with national trends.

In total, MIT's sponsored research revenue (which includes federal, foundation, industrial, and international sponsors) was a substantial 43.9% of its adjusted unrestricted operating revenues in 2014. Management indicated that MIT negotiates its research recoveries on an annual basis with its agent, the Office of Naval Research. The fiscal 2014 indirect cost-recovery rate was 56%, and MIT's particular negotiated rates generally allow it to recover full costs over a multiyear period.

### Management and governance

The members of MIT's senior management team have been with the organization for several years although some are in relatively new positions. L. Rafael Reif was named MIT's president in July 2012 after serving as provost for seven years and in various other positions at MIT since 1980. Other relatively recent additions to the senior management team include Provost, Martin Schmidt. MIT is governed by the MIT Corp., a 75-member body composed of national leaders in science, industry, and education. The executive committee, a smaller subset of the same body, has responsibility for the general administration and approves borrowing plans. Management routinely prepares interim, full-accrual results, which the executive committee reviews. We view the preparation and review of interim financial statements as a best practice for the industry.

In 2013, President Reif launched an Institute-wide "Task Force on the Future of MIT Education," comprised of three working groups and focused on looking at the future of higher education and MIT's role as it relates to such areas as

facilities, their involvement in online and global education, and the Institute's financial model. We consider this a very proactive approach to addressing some of the long-term challenges currently facing the higher education sector and understand MIT hopes to be at the forefront of any change. We will assess the credit impact of any such organizational changes as they emerge, as major shifts or initiatives for any organization may have rating implications if they require substantial investment or significantly affect annual financial operations, financial resources, or the economic profile.

### **Demand and enrollment**

MIT is an exceptionally selective Institute and admissions remain very competitive at both the undergraduate, graduate, and professional levels. Freshman applications at MIT remain extremely strong although they declined 3.3% for fall 2014. However, the acceptance rate became even more selective with 7.9% of the Institute's freshman applicants accepted for fall 2014. The Institute's matriculation rate was a strong 72%. Undergraduate student quality is impressive, with an average two-part SAT score of approximately 1,492 and an average ACT score of 34 for fall 2013. Freshman-to-sophomore retention is very high, at 98%, and approximately 89% of its undergraduate students graduate within five years. MIT draws students from 50 states and more than 115 countries. Total student charges of \$58,240 for the 2014-2015 academic year were a 3.6% increase over the previous year and place MIT in line with its peer institutions, such as Harvard, Columbia, and Yale universities. Final fall 2014 enrollment information was not available as of this report, but we expect it to be similar to previous years.

MIT's graduate and professional schools are also highly competitive. Final fall 2014 enrollment numbers were not available at the time of this report, but are expected to be in line with previous years. Applications for graduate and professional studies were flat with fall 2013 at 23,874, with 14.1% of applicants accepted. There are no current plans to add new schools or significantly change the academic mission or structure of the Institute. MIT is actively engaged with international partners but has no plans to increase its physical footprint globally.

### **Capital plans**

MIT is developing its long-term capital plan, also in conjunction with MIT 2030 (a collaborative, capital planning framework put in place in 2011), to add new research facilities and new academic space, improve its infrastructure, and to reduce the amount of deferred maintenance on campus. The academic components' projected cost for the next 10 years is \$1.55 billion, which we consider high, with the proceeds from the May 2011 \$750 million and April 2014 \$550 million 100-year taxable issuances supporting a portion of capital needs. Other financing sources include fundraising, internal funding sources, and any further external borrowings (the exact size and timing of which are still yet to be determined). We will determine the effects of such external borrowings on the credit rating closer to the time of issuance once additional details are available. There are other capital plans on campus, including additional financings in the form of nonrecourse debt for investment in the Institute's existing real estate assets, as well as a revitalization of Lincoln Lab.

Management indicates that the existing real estate portfolio is managed like an endowment asset and provides important flexibility for future institutional development. Management indicated that it intends to pursue real estate financings that can be supported by nonrecourse arrangements supported by external lessees. The proposed new facilities at Lincoln Lab are likely to be financed by a third party backed by revenues from the Federally Funded Research and Development Center contract, which management believes would effectively be nonrecourse to MIT.

## Financial Profile

### Operating performance

We consider MIT's diverse revenue stream a credit strength, with tuition and fees accounting for \$595 million (21.1%) of unrestricted revenue (on a gross basis) in fiscal 2014. Other major revenue sources included sponsored research of \$1.53 billion (43.9% of adjusted revenues), gifts and bequests of \$162 million (4.8% of revenues), fees and services of \$176.3 million (5.2% of revenues), and endowment income and gain used for operations of \$515.4 million (18.4% of revenues). Despite federal funding challenges and the threat of sequestration, campus research increased slightly for the year to \$480.5 million in grants, including those from the:

- Department of Health and Human Services (\$115.1 million),
- Department of Defense (\$122.8 million),
- Department of Energy (\$88.5 million),
- National Science Foundation (\$79.0 million), and
- NASA (\$32.1 million).

Though federal research revenue continues to decline, the Institute has been able to offset those declines through increases to nonfederal research money, including from nonprofits and industry. In addition, net tuition revenue increased by 4.6% for fiscal 2014, and private giving for current use and endowment spending also increased for the year. The Institute produced a \$205.8 million surplus in fiscal 2014 (6.5% margin), maintaining its consistently positive operating performance, although this is somewhat lower than the 8% plus margins produced in fiscal 2012 and 2013. We expect similar strong performance to continue.

### Financial resources

In our opinion, MIT's financial resource ratios are adequate for the rating category. Total cash and investments of \$16.5 billion as of fiscal 2014 equaled 5.18x adjusted operating expenses and 5.66x outstanding debt. Expendable resources of \$13.5 billion were 4.2x operating expenses and 4.6x debt. We expect these ratios will continue to improve given the Institute's healthy operating margins, and we expect an increase in debt to be commensurate with an increase in resources such that financial resource measures remain consistent with the 'AAA' category.

### Endowment and fundraising

MIT Investment Management Co. (MITIMCo) manages the Institute's investment assets under the supervision of a separate MITIMCo board. MIT's endowment assets totaled \$12.42 billion as of June 30, 2014, up from \$10.86 billion the previous year. The investments in Pool A produced a 19.2% return for fiscal 2014. Of \$16.2 billion of total long-term investments as of June 30, 2014, \$4.1 billion, or 25%, were considered level 1, or active market securities, followed by \$1.0 billion in level 2, and the majority (\$11.1 billion) in level 3 the least liquid. Management reports that MIT's asset allocation has been stable and is tracking close to the policy. As of June 30, 2014, MIT held same-day liquid investments of about \$1.8 billion. MIT uses a Tobin rule endowment distribution policy based 80% on the previous year's spending and 20% based on the endowment's market value.

Endowment spending for operations in fiscal 2014 was \$515.4 million, or approximately 4.1% of the endowment's year-end value. The annual endowment draw equaled approximately 15.2% of the Institute's adjusted operating

revenues for fiscal 2014, which is less than some of its peers.

MIT holds investments in two primary asset pools: pool A, composed of its long-term endowment investments, and pool C, composed of short-term, high-quality investments for working capital and for holding various reserves. From 2008-2010, the amount of reserves in pool C was increased to provide for additional liquidity. Management indicates that it did not have to access its bank line for liquidity support during this period, and that the investment pool liquidity was sufficient to support calls on capital. As of June 30, 2014, MIT had total unfunded capital calls of approximately \$2.15 billion. The unfunded commitment amount represents a moderate 17% of market value of endowment, which is lower than some of MIT's peers.

In 2011, MIT concluded a \$500 million "Campaign for Students" fundraising initiative, which raised more than \$578 million. Total gifts and pledges in fiscal 2014 were \$452.7 million. It is likely that MIT will embark on another capital campaign, or series of fundraising initiatives, in conjunction with its new strategic development framework, MIT 2030, but no plans have been publicly announced. Management reports that the fiscal 2014 alumni-participation rate was approximately 28%.

### **Debt**

MIT had total long-term debt of \$2.92 billion as of June 2014, including about \$177 million drawn under a \$500 million bank line of credit. We understand that the Institute uses this line opportunistically and periodically for various funding purposes.

MIT's debt structure includes a number of bullet maturities and, due to the Institute's tendency to use bullet maturities to repay principal on its debt, total annual debt service through fiscal 2041 on average is approximately \$168 million, ranging from \$71 million in 2039 to \$348 million in 2031. MADS of \$348 million in the next 30 years is high, in our view, at 10.9% of fiscal 2014 adjusted operating expenses. In 2011, the Institute also issued century bonds, which produced MADS of \$818 million in 2111 (25.7% of fiscal 2014 expenses). Average annual debt service of \$188 million is a more manageable 5.9% of fiscal 2014 expenses and just more than fiscal 2014 actual debt service of \$162.4 million.

MIT remains conservative in its use of variable-rate debt exposure, net of swaps, compared with its peers. Of the total debt, a small portion is variable-rate debt (14% or \$343 million), with the remainder fixed rate. All debt is an unsecured general obligation of MIT. In our opinion, MIT has adequate liquidity to fund its VRDBs.

### **Contingent liabilities**

Standard & Poor's believes the Institute's swap portfolio poses very low risk to the credit rating overall, with a low degree of involuntary termination risk due to limited termination events other than those permissible, moderate counterparty risk, and the swap portfolio's sound economic viability during stressful economic cycles. MIT has one interest rate swap with Deutsche Bank. The agreement is a \$125 million floating-to-fixed rate swap that synthetically fixes the series J-1 bonds at 4.91%, with MIT receiving a rate equal to the Securities Industry and Financial Markets Assn. (SIFMA) index less 15 basis points; the agreement terminates on maturity in 2031. As of June 30, 2014, this swap had a notional amount and fair value of \$125 million and negative \$41.3 million, respectively.

MIT has a defined-benefit and defined-contribution retirement plan for employees. Its defined-benefit plan is well funded, with a \$20.4 million contribution in 2014. MIT had \$4.9 million in accrued defined-benefit liabilities net of

assets and \$43.9 million in accrued postemployment benefit obligations net of assets as of June 30, 2014, which we view as a manageable level of exposure.

<b>Massachusetts Institute of Technology</b>						
	<b>--Fiscal year ended--</b>			<b>Medians</b>		
	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>Private colleges and universities 'AAA' 2013</b>	<b>Private colleges and universities 'AA' 2013</b>	
<b>Enrollment and demand</b>						
Headcount	11,301	11,189	10,894	MNR	MNR	
Full-time equivalent	11,237	11,075	10,763	11,449	3,184	
Freshman acceptance rate (%)	8.2	8.9	9.7	11.0	28.8	
Freshman matriculation rate (%)	72.1	70.1	64.6	50.7	34.3	
Undergraduates as a % of total enrollment (%)	40.1	40.2	40.2	49.1	74.5	
Freshman retention (%)	N.A.	97.8	97.4	97.9	95.0	
Graduation rates (five years; %)	N.A.	89.2	91.3	94.1	88.0	
<b>Income statement</b>						
Adjusted operating revenue (\$000s)	3,395,622	3,445,321	3,242,005	MNR	MNR	
Adjusted operating expense (\$000s)	3,189,816	3,167,303	2,996,295	MNR	MNR	
Net operating income (\$000s)	205,806	278,018	245,710	MNR	MNR	
Net operating margin (%)	6.45	8.78	8.20	3.50	0.70	
Change in unrestricted net assets (\$000s)	966,176	916,439	-18,764	MNR	MNR	
Tuition discount (%)	45.5	45.5	47.7	41.2	36.1	
Tuition dependence (%)	17.5	16.5	16.3	25.4	50.2	
Student dependence (%)	21.1	19.8	19.6	MNR	MNR	
Research dependence (%)	43.9	45.6	46.3	MNR	MNR	
Endowment and investment income dependence (%)	18.4	17.3	16.9	MNR	MNR	
<b>Debt</b>						
Outstanding debt (\$000s)	2,918,901	2,428,215	2,460,002	1,475,931	255,027	
Current debt service burden (%)	5.09	4.51	3.45	4.81	3.94	
Current MADS burden (%)	7.31	7.36	9.37	MNR	MNR	
<b>Financial resource ratios</b>						
Endowment market value (\$000s)	12,425,131	10,857,976	10,149,564	7,240,505	1,028,501	
Cash and investments (\$000s)	16,526,515	14,130,013	13,087,243	MNR	MNR	
Unrestricted net assets (\$000s)	6,467,131	5,500,955	4,584,516	MNR	MNR	
Expendable resources (\$000s)	13,479,986	11,057,197	9,844,361	MNR	MNR	
Cash and investments to operations (%)	518.1	446.1	436.8	795.8	354.5	
Cash and investments to debt (%)	566.2	581.9	532.0	773.4	442.0	



Massachusetts Institute of Technology (cont.)					
Expendable resources to operations (%)	422.6	349.1	328.6	602.9	224.7
Expendable resources to debt (%)	461.8	455.4	400.2	560.0	290.9
Average age of plant (years)	9.1	8.8	8.4	11.5	13.2

Total adjusted operating revenue = unrestricted revenue less realized and unrealized gains/losses and financial aid. Total adjusted operating expense = unrestricted expense plus financial aid expense. Net operating margin = 100\*(net adjusted operating income/adjusted operating expense). Tuition dependence = 100\*(gross tuition revenue/adjusted operating revenue). Current debt service burden = 100\*(current debt service expense/adjusted operating expenses). Current MADS burden = 100\*(maximum annual debt service expense/adjusted operating expenses). Cash and investments = cash + short-term & long-term investments. Expendable resources = unrestricted net assets + temp. restricted net assets - (net PPE- outstanding debt). Average age of plant = accumulated depreciation/depreciation & amortization expense. MADS—Maximum annual debt service. MNR—Median not reported. N.A.—Not available.

## Related Criteria And Research

### Related Criteria

- USPF Criteria: Higher Education, June 19, 2007
- USPF Criteria: Commercial Paper, VRDO, And Self-Liquidity, July 3, 2007
- Ratings Above The Sovereign: Corporate And Government Ratings—Methodology And Assumptions, Nov. 19, 2013
- USPF Criteria: Contingent Liquidity Risks, March 5, 2012

### Ratings Detail (As Of September 19, 2014)

#### Massachusetts Institute of Technology taxable medium term nts Series B

*Long Term Rating* AAA/Stable Affirmed

#### Massachusetts Development Finance Agency, Massachusetts

Massachusetts Inst of Tech, Massachusetts

#### Massachusetts Dev Fin Agy (Massachusetts Institute of Technology) rev bnds ser 2008-O

*Long Term Rating* AAA/Stable Affirmed

#### Massachusetts Dev Fin Agy (Massachusetts Institute of Technology) VRDBs ser J-1, J-2

*Long Term Rating* AAA/A-1+/Stable Affirmed

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An aerial night photograph of the MIT campus and the surrounding Boston skyline. The campus buildings are illuminated with warm yellow lights, and the city lights are visible in the background under a dark blue sky. The year '2015' is written vertically in a large, black, serif font on the right side of the image.

2015

# Report of the Treasurer

for the year ended

June 30, 2015



Massachusetts  
Institute of  
Technology