


Building On Our Strategic Plan



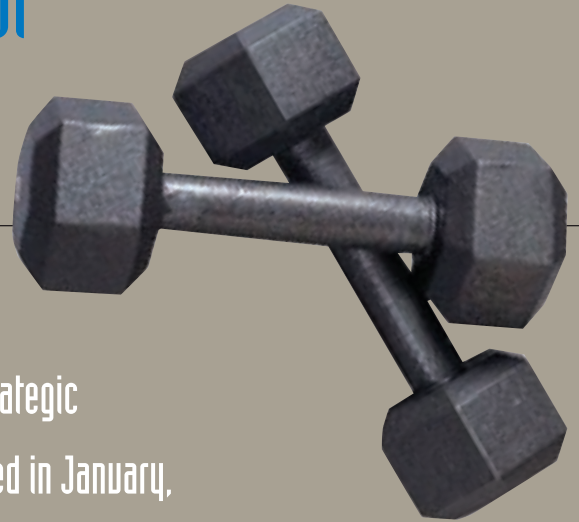
2006 Annual Report

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As part of the Strategic Plan, the Board of Directors
is taking steps to raise MTI's profile in Asia.

Having an exercise plan is not enough to make you fit.



You have to follow through with the plan and exercise. The same is true with Materials Technology Institute's Strategic Plan. Without follow through, the Strategic Plan—adopted in January, 2005—would be nothing more than an exercise in futility.

But that is not the case. Throughout 2006, MTI has been moving forward with our Strategic Plan. A plan to build a stronger, more relevant, and more valuable MTI for the processing industry of the future.

MTI's Strategic Plan includes four primary goals:

- Increase and maintain membership diversity.
- Expand MTI's network to serve our worldwide membership.
- Increase the value of participation.
- Excel at communicating the benefits and value of membership.

We invite you to read through this report to see how MTI is putting our Strategic Plan into action—and getting results.

Maximizing resources through a global network of materials specialists.

MTI's Mission

MTI maximizes member asset performance by providing global leadership in materials technology to improve safety, reliability and profitability.

MTI accomplishes its mission by meeting the following objectives:

1. Serve the needs of our members in key processing industries, such as: refining, mining, energy production, food processing, semi-conductor manufacturing, chemical production, pulp and paper, pharmaceuticals, and other processing industries.
2. Sponsor R&D that matters to our members:
 - Develop valuable new technologies
 - Incorporate new knowledge into operating practices.
3. Provide networking opportunities so members can achieve the associated benefits:
 - Exchange of non-proprietary information
 - Leveraging of resources among technical organizations, universities, and consortia.
4. Identify, develop, and disseminate information on state-of-the-art technologies that offer clear benefits to processing facilities and operations.
5. Provide continuing professional education opportunities in materials technology.
6. Influence the development and appropriate use of pertinent codes, standards, and regulations.

MTI's Vision

By 2015, MTI will operate a robust global network recognized as the preferred source for materials technology solutions that enhance processing safety, reliability, profitability, and sustainability.



Benefits of Membership

MTI membership provides a variety of benefits that include:

- Access to a network of materials engineering specialists with many years of experience in all facets of process industry materials engineering. The leverage provided by this network multiplies the capability of the members' engineering staff for a fraction of the cost of a single engineer.
- Members actively participate in the selection and definition of MTI projects. This participation provides members an opportunity to ensure that the project meets their needs. This leveraged project system provides the member with access to projects in a variety of materials related fields and gives members a development capability they would not otherwise have.
- Members have immediate access to information being developed by MTI projects that is not available to non-members.
- Participation in the three Technical Advisory Council meetings held each year is an excellent source of practical training for engineers new to the process industry as well as for veterans who learn from each other during both project and forum discussions.



MTI Projects Deliver Value to Member Companies

MTI projects cover a spectrum of opportunities for manufacturing companies to be more profitable, efficient, and safe. Membership in MTI brings sustainable benefits.

Lifecycle Cost

Atlas of Microstructures

Knowledge of the microstructural changes that occur in steam reforming furnace tubes during service is desirable to assist in predicting life. Samples of today's new high temperature tube alloys have been examined to develop an understanding of these microstructural changes. Final report is in progress.

Repair of Polymeric Materials

Plants often have difficulty deciding when polymeric materials need to be repaired and determining the best way to repair them. MTI is preparing guidebooks along with video training materials that will help plants make safe and cost effective decisions regarding damage assessment and repair of polymeric materials in chemical plants.

Designing Equipment for Ease of Inspection

Often the use of the most common design methods makes it difficult and expensive to inspect equipment. By changing design practices, it is often possible to reduce the cost while increasing the effectiveness of plant inspections. This project will identify techniques that can improve the effectiveness of inspections and thereby reduce costs while increasing reliability.

Repair of Glass Lined Equipment

Plants often have difficulty determining the best way to repair glass lined equipment. MTI is preparing a guidebook that will help plants make safe and cost effective decisions regarding damage assessment and repair of glass lined equipment in chemical plants.

Technology

Rouging

The phenomenon of discoloration of stainless steel in high purity water is often associated with pharmaceutical applications at elevated temperatures. This project is working to identify the mechanism and find ways to prevent its formation.

Metal Dusting

This high temperature corrosion phenomenon causes severe damage to equipment in steam reforming, Syngas, and certain chemical processes. The focus of the work is to identify the parameters that control metal dusting and to recommend resistant new/improved alloys and coatings.

Continuous Improvement

Recognizing Corrosion

MTI has incorporated process safety management principles into an E-learning based training program for recognizing corrosion which may be used for information and qualification.

Measuring Casting Quality

The use of casting simulation to anticipate the presence of casting defects and to correct them before the casting is made is being explored.

Titanium Allowable Stresses

Modern technology has generated stronger, unalloyed titanium. MTI has completed a study showing the allowable stresses of several grades of unalloyed titanium could be safely increased. These changes have now been incorporated into ASTM Standards and an ASME Code Case. Work is continuing to raise the upper temperature usage limit.

Safety

Incident Assessment

Revision of MTI's Guidelines for Assessment of Fire and Explosion Damage to reflect significant advances in the technologies will include case histories. Upon completion of the revision, a separate project idea would be to create some type of training/instructional module for incident assessment, probably in an "on-demand" web-based format.

Knowledge Management

Experience and knowledge of materials engineers is difficult to transmit to other engineers and to operating personnel. As an example, MTI is generating a series of bulletins that will transmit this knowledge in a concise, understandable, and useful form to personnel without a specialized knowledge of materials engineering.

MS Series

MTI has issued seven Materials Selector volumes that are an expanding series of state of the art reference books offering guidance for materials of construction in hazardous, corrosive chemicals, including the most commonly used inorganic and organic acids. The 8th book on organic solvents is in progress.

Reliability

Instrument Reliability

This is one of a projected series of manuals aimed at the Maintenance Professional at both the technician and engineer level. They are intended to fill the gap between generic best practices and specific equipment supplier manuals.

Hurricane Damage and Remediation

As a result of hurricanes Katrina and Rita, MTI members recognized the need to prevent and repair damage from hurricanes.

Welding of Titanium Clad Steel

Currently chemical plants use batten strips to weld titanium clad steel. This project has demonstrated a weld process in the lab that could remove the need to use batten strip designs thereby improving reliability and reducing initial and total life cycle costs.

Evergreening Risk Based Inspection (RBI)

MTI issued a book in 2005 on Implementing and Evergreening of RBI in Process Plants. We are now taking steps to ensure that the information in this book remains current.

Below Left: MTI rouging test system as-installed at Monsanto plant. Below Right: MTI members recognized the need to prevent and repair damage from hurricanes.



Report of the Chairman—Board of Directors



In 2005 the Board of Directors created a strategic plan for MTI. The purpose of a strategic plan and the process used in creating it is to establish direction for the organization through the identification of both goals and the activities designed to attain those goals. Strategic

planning is not a one time exercise that produces a static document, rather it is an ongoing process that requires continual review and reassessment as the operational environment evolves. The strategic planning process was and is intended to provide MTI with a plan to proactively manage the many changes that impact our organization. The complete strategic plan document is available on the MTI web site at www.mti-global.org. The plan includes four strategic goals and in this report I will share some of the actions we have taken to support those goals.

Goal 1: Increase and Maintain Member Diversity

Goal 1 addresses both the primary location of our member's business operations and the industry sectors in which they work. Our intent is to expand MTI's membership in non-North American markets and into business sectors beyond the traditional chemical process industry. It is clear that most growth in the chemical industry will be outside North America. If MTI is to continue as a significant contributor in the materials arena we must move with the industry. In 2006 a special effort has been underway to identify 20 key target companies and upper level managers within those companies who can make a decision about MTI membership. That list includes companies outside the traditional CPI and we have picked up an energy sector member in Syncrude. This is a challenging project since it is difficult to identify the correct contacts within the target companies.

Goal 2: Expand the MTI Network to be More Global

This goal is closely linked with the first and there is some overlap in our efforts in that we are trying to broaden our network to include more international resources. In the spring, a memorandum of understanding was put in place with EUMaT that will give MTI a voice in EUMaT's planning and funding of materials related research. EUMaT is a European effort intended to fund materials related research that will benefit MTI member companies. Participation will raise MTI's profile in Europe and we believe this will both help European member recruiting and provide funding for critical research needs of interest to most MTI member companies.

The organization of this year's EuroTAC meeting was changed to include a leader based in Europe. Mike Turner of Akzo Nobel very ably filled this role and helped us determine the direction of future European meetings and initiatives. I believe eventually there will be an essentially autonomous EuroTAC that will develop projects independent of the North American based TAC.

In October, 2006 the BOD will meet with a delegation representing METI (Ministry of Economy, Trade and Industry, Government of Japan) to share information about chemical plant reliability and safety. We believe this interaction will raise MTI's profile within the Japanese chemical industry providing a boost to recruitment and opening the door to jointly funded research centered in Asia. Reliability is an area of high interest to the MTI membership and jointly organized and funded work in this field will benefit all of MTI's membership while demonstrating the value of MTI participation to potential members in Japan.

Finally a "China Needs Assessment" survey was conducted to determine how the membership views their need for MTI services in China. We are all aware of the furious pace of development in China and the BOD will be using this survey to help determine what our response should be.

Goal 3: Increase Value of Participation

The value of participation can be viewed from both the member companies' perspective and the individual member representative's perspective and MTI is addressing both aspects of this value equation. In order to expand the number of well executed projects a project management guide has been created that includes a flowchart designed to help project participants see their projects through to the best conclusion. This document has been completed and is available to all who participate in MTI projects. We also believe that recognition of outstanding individual efforts in support of MTI activities is a benefit we can provide to member representatives. In 2006 I sent letters of recognition to the management of those who participated in several MTI projects. We also continue to emphasize the MTI Fellow program resulting in the selection of three new Fellows.

Goal 4: Excel at Communicating the Benefits and Value of Membership

In this world of almost overwhelming information flow it is critical to effectively and efficiently communicate membership value to all of MTI's stakeholders. In order to improve our communications MTI has contracted with Kirk Richardson, a newsletter expert, to create a newsletter designed to showcase MTI to a broad audience ranging from current member reps and their management to potential members. The first newsletter was distributed at the St Louis meeting and the feedback has been very positive. Our plan is to publish a newsletter at each meeting and to distribute them by mail to a wide audience. The result should be increased awareness within the member companies of the excellent work done by MTI as well as expanded membership as potential members recognize the value of MTI's activity.

As you can see the strategic plan has provided a blueprint for activity that should have a positive impact on MTI. The strategic planning experts advise an annual review of the plan to make sure it remains in alignment with changes in the business environment. In 2007 the BOD will conduct a review of the strategic



An effort has been underway to identify 20 key target companies and upper level managers within those companies who can make a decision about MTI membership.

plan to determine how well it is working and whether any significant changes are required. I am pleased with the progress we have made and look forward to further progress in the future.

I can't close without first recognizing the many contributions made by our staff and volunteers to the success of MTI. I would have nothing to report without the outstanding efforts of Jim Macki and his staff who are always innovative when it comes to improving MTI projects and operations. Likewise, without the contributions of our member representatives who contribute many hours to the execution of projects and to the on line forum discussions MTI would be a far less valuable organization. Finally, I must thank the members of the Board of Directors who give a great deal of time and energy behind the scenes to MTI and provide the leadership required to keep MTI on track. Thanks to all of you for your efforts and contributions to MTI.

Gary S. Whittaker
Chairman, Board of Directors

Report of the Chairman—Technical Advisory Council



MTI continues to change to meet the changing needs of its member companies. This change is being guided by the Strategic Plan developed by the Board of Directors. The Technical Advisory Council is supporting the implementation of the MTI strategy.

If you have studied the guidance documents for MTI, you will already have seen the focus within the organization on providing value to our members. Over the last several years there has been a subtle but significant change in how we view and communicate the value and benefits of MTI to members and potential members. The reasons for that shift are probably obvious, but one of the key drivers has been the understanding that the funding for MTI in any member company is likely to be competing with many other worthy investment opportunities. The approval required to “sign the check” for MTI each year must be based on the value achieved on an annual basis. All of our member companies are expecting a return on their investments.

The MTI “Roadmap for Process Equipment Materials Technology” published in October 2003 established materials related performance targets that clearly represent the goals for the process industries. These targets reflect the continuing need to reduce costs, improve productivity, optimize resources, protect the environment, and ensure safe operating conditions. All of these factors provide quantifiable value to the industry. The Roadmap continues to provide the focus for the development of new projects within MTI.

Both the vision and mission of the organization include a focus on improving the safety, reliability and profitability of process industry.

The MTI 2005 Strategic Plan builds on the Roadmap by defining four key strategies for the organization. Two of the four strategies are focused on value:

- Increase the Value of Participation
- Excel at Communicating the Benefits and Value of Membership

It is expected that the value of participation in MTI will be increased by:

- Following the Roadmap to ensure that projects of high value to the membership are identified and executed.
- Expanding funding resources outside of MTI to expand the portfolio of active, high value projects underway at any give time.
- Increasing member participation in projects, the technical forum and leadership roles in the organization.

Some of the tangible benefits of participation in MTI are clearly defined in the strategic plan. These include:

- Leveraging provided by access to a network of materials engineering specialists with many years of experience in all facets of process industry materials engineering.
- Members actively participating in the selection, definition and execution of MTI projects. This participation provides the member with an opportunity to ensure that the project meets their needs.
- Members having immediate access to information being developed by MTI projects that is not available to non-members.
- Participation in the three Technical Advisory Council meetings held each year is an excellent source of practical learning from the best materials engineers in the industry.

A handwritten signature in blue ink that reads "John E. Aller". The signature is fluid and cursive.

John E. Aller
TAC Chairman

Executive Director's Letter



MTI was created by a small group of CPI materials engineering specialists to pool limited resources to solve common, non-proprietary materials problems. Their vision has paid off in spades. MTI has grown into the premier resource for CPI materials engineers. Indeed,

MTI has adapted to the changing needs of the industry and has a strategic plan to ensure that we continue to frugally deliver engineering solutions to our member companies for the future.

As member company engineering staffs have been reduced, MTI has increased its technical staff to ensure that participation in MTI activities efficiently uses member's time. We now have five technical staff members each with over 30 years experience in our industry. MTI project participation is an example of members leveraging their own technical staffs and benefiting from the contributions of MTI technical staff and other member company staff's efforts directed at common problems.

MTI staff has had a busy year supporting member activities. True to our founding purpose, most activities involve pooling members' resources to support activities. For example, MTI hired a consultant to provide data for and to participate in an ASME committee with the objective of recognizing the 15% greater strength of Grade 2 titanium and thereby to raise the allowable design stresses for titanium. This has the potential for saving CPI companies about \$8 million dollars annually.

For another project, MTI hired a technical consultant to facilitate the generation of CPI related supporting documents for the API In-Service Inspection Code Committees. Using the consultant ensures that MTI members' input is provided within the constraints of the API committees' tight schedules without additional costs to the member companies.

MTI projects normally result in our publishing books for the benefit of our members. These books serve as technical references and a valuable reference for many years after the projects are completed. Approximately 30 MTI publications have been converted to PDF files and are being distributed on DVDs to MTI members.

MTI continues to control operating costs to maximize the amount of dues income available to support member driven project activities. As a result, MTI has resources to fund all current potential projects being developed including the dozen new project teams which formed this year.

At the direction of the BOD, MTI staff has supported European members by arranging an annual EuroTAC for several years. The MTI members in Europe are providing leadership and direction with staff assuming a support function similar to regular TAC meetings. EuroTAC 2006 was a marked success with 37 attendees for the 2 ½ day meeting.

Staff has worked diligently to control meeting costs in spite of the increased hotel facility prices attributed to room shortages caused by the Gulf Coast storms of 2005. To this end, we moved our February 2007 meeting from Florida to Galveston.

MTI schedules state-of-the-art presentations for members during regular TAC meetings. TAC 88 included three of these presentations: Two stainless steel casting presentations and Gene Liening's presentation "Change in the Chemical Industry and What It Means to You." The presentations were converted into electronic presentations and were distributed via CD and MTI's web site.

MTI staff continues to provide the key component of the "pooled resources" provided by member companies to solve their common problems.

A handwritten signature in blue ink that reads "James M. Macki". The signature is written in a cursive, flowing style.

James M. Macki
Executive Director

Member Companies & Designated Representatives*



3M Company
St. Paul, Minnesota
J. J. Warinsky



Air Liquide
Paris, France
J. Furtado



Air Products and Chemicals, Inc.
Allentown, Pennsylvania
W. R. Watkins



Akzo Nobel Technology & Engineering
Arnhem, The Netherlands
E. R. Naylor



Albemarle Corporation
Richmond, Virginia
T. E. Henke



Allegheny Technologies, Inc.
Pittsburgh, Pennsylvania
R. Scheel



AstroCosmos Metallurgical
Division of Carbone Lorraine
Wooster, Ohio
D. Frey



BASF Corporation
Mt. Olive, New Jersey
G. Busby



Bayer Technology Services GmbH
Leverkusen, Germany
M. H. Renner



BP
London, England
W. K. Blanchard



Celanese Corporation
Dallas, Texas
A. H. Rakhe



ConocoPhillips, Inc
Houston, Texas
D. McIntyre



Corrosion Materials
Baker, Louisiana
R. Smith



Cytec Industries
West Paterson, New Jersey
D. McIntyre



Det Norske Veritas
Houston, Texas
R. Smallwood



Dow Chemical Company
Midland, Michigan
E. L. Liening



DuPont Company
Wilmington, Delaware
P. R. Khaladkar



Dynamic Materials
Boulder, Colorado
J. Banker



Eastman Chemical Company
Kingsport, Tennessee
G. S. Whittaker



Electro Chemical Engineering and Manufacturing Co.
Emmaus, Pennsylvania
D. K. Heffner



Eli Lilly and Company
Indianapolis, Indiana
D. F. Jensen



ELLETT Industries Ltd.
Port Coquitlam,
British Columbia
R. D. Gill



Engineers India Limited
New Delhi, India
V. R. Krishnan



The Equity Engineering Group, Inc.
Shaker Heights, Ohio
C. White



ExxonMobil Chemical
Baytown, Texas
B. J. Fitzgerald



Falconbridge Limited
Falconbridge, Ontario
F. McGlynn



FMC Corporation
Princeton, New Jersey
S. Kesavan



Gasket Resources, Inc.
Exton, Pennsylvania
G. Grubert



Haldor Topsøe
Lyngby, Denmark
M. J. L. Østergård



MeadWestvaco Corporation
Stamford, Connecticut
J. D. Willis



RathGibson
Janesville, Wisconsin
D. R. Moore



Sandvik Materials Technology
Sandviken, Sweden
E. Gomes



Haynes International, Inc.
Kokomo, Indiana
P. Manning



Food • Health • Hope™

Monsanto Company
St. Louis, Missouri
R. W. Armstrong



Roben Manufacturing, Inc.
Lakewood, New Jersey
W. Masterson



Schmidt+Clemens GmbH+Co
Lindlar, Germany
R. Kirchheiner



Hellenic Petroleum S. A.
Thessaloniki, Greece
S. A. Perdikopoulos



Nickel Institute
Toronto, Ontario
G. Coates



The Roberts Company
Winterville, North Carolina
K. Wyrough



Shell International Oil Products B.V.
Amsterdam, The Netherlands
W. C. Fort, III



Honeywell
Morristown, New Jersey
S. Eason



Nova Chemicals Corporation
Sarnia, Ontario
G. Donald



Rohm and Haas Company
Philadelphia, Pennsylvania
B. S. Frechem



Special Metals
Huntington, West Virginia
J. Crum



Joseph Oat Corporation
Camden, New Jersey
L. Bower



Outokumpu, Inc.
Schaumburg, Illinois
E. Torsner



Rolled Alloys
Temperance, Michigan
P. Whitcraft



Syncrude Canada Ltd.
Fort McMurray, Alberta Canada
M. Anderson



Lloyd's Register Capstone, Inc.
Houston, Texas
J. E. Aller



P.A. Inc.
Houston, Texas
O. Galloway



SABIC
Geleen, The Netherlands
H. Schrijen



Victaulic
Easton, Pennsylvania
D. D. Christian



Lyondell Chemical Company
Houston, Texas
K. K. Kirkham



Procter & Gamble Company
Cincinnati, Ohio
B. W. Tholke

Board of Directors



Seated Left to right:

Gary S. Whittaker, Chairman
Senior Materials Engineering Associate
 Eastman Chemical Company
 Kingsport, Tennessee

Michael Renner
*Director Materials Engineering /
 Mechanical Integrity*
 Bayer Technology Services GmbH
 Leverkusen, Germany

Dale Heffner, Vice-Chairman
Vice President
 Electro Chemical Engineering &
 Manufacturing Co.
 Emmaus, Pennsylvania

Standing Left to right:

William C. Fort, III
Principal Engineer
 Shell Global Solutions International
 Amsterdam, The Netherlands

Robert Gill
Vice President, Sales
 ELLETT Industries Ltd.
 Port Coquitlam, British Columbia

Roger Armstrong
Corporate Materials Engineer
 Monsanto Company
 St. Louis, Missouri

**Srini Kesavan, TAC Vice Chair,
 Ex Officio,**
Principal Engineer
 FMC Corporation
 Princeton, New Jersey

Randy Scheel
Director of Chemical Operations
 Allegheny Technologies, Wah Chang
 Pittsburgh, Pennsylvania

Kelly E. Wyrough
Director of Technical Services
 The Roberts Company
 Winterville, North Carolina

Eugene L. Liening
Senior Materials Engineering Associate
 Dow Chemical Company
 Midland, Michigan

**John E. Aller, TAC
 Chair, Ex Officio**
President
 Lloyd's Register Capstone, Inc.
 Houston, Texas

Pradip Khaladkar
*Senior Consultant, Plastics,
 Elastomers & Composites Technology*
 DuPont
 Wilmington, Delaware

Edward R. Naylor
Senior Materials Engineering Associate
 Akzo Nobel Technology & Engineering
 Arnhem, The Netherlands

The Board of Directors, elected by the Member Representatives, manages the business of MTI.



Directors

Seated Left to right:

Emory Ford
Associate Director

Galen Hodge
Associate Director

Standing Left to right:

Barry Greene
Associate Director

James Macki
Executive Director

Tony Scribner
Associate Director



St. Louis Staff

Left to right:

Lori Elgin
Administrative Assistant

Debby Ehret
Operations Director

Debbie Linder
Administrative Assistant

Technical Advisory Council

The Technical Advisory Council, composed of one representative of each member company, solicits project ideas, defines projects and recommends projects for approval by the Board of Directors.

John E. Aller, Chairman

President
Lloyd's Register Capstone, Inc.

Srini Kesavan, Vice-Chairman

Principal Engineer
FMC Corporation

Michael Anderson

Research Associate Metallurgical Engineer
Synchrude Canada Ltd.

Roger Armstrong

Corporate Materials Engineer
Monsanto Company

John Banker

Vice President Sales & Marketing
Dynamic Materials

Dave Barber

Materials Engineering Associate
Dow Chemical Company

W. Keith Blanchard

Senior Corrosion/Materials Engineer
BP

Cheryl Botti

Manager Marketing and Product Development
Allegheny Technologies

Lawrence H. Bower

Chief Engineer
Joseph Oat Corporation

Keith F. Briegel

Manager Materials and Inspection Group Engineering Division–Houston
Rohm & Haas Company

Greg Busby

Senior Materials Engineer
BASF Corporation

Daniel D. Christian

Industrial Business Development Manager
Victaulic

Gary Coates

Technical Director
Nickel Institute

Paul Crook

Manager Product Research and Development
Haynes International, Inc.

Jim Crum

Principal Materials Scientist
Special Metals Corporation

George Donald

Mechanical Engineer, Regional Metallurgy
Nova Chemicals Corporation

Brian J. Fitzgerald

Senior Engineering Associate
ExxonMobil Chemical Company

William C. Fort, III

Principal Engineer
Shell Global Solutions International

David Frey

VP Technology
AstroCosmos Metallurgical

Jader Furtado

Project Manager
Air Liquide

Otis Galloway

Vice President–General Manager
P.A., Inc.

Robert D. Gill

Vice President, Sales
ELLETT Industries Ltd.

Eduardo Gomes

Technical Marketing Manager
Sandvik Materials Technology

John Grocki

Consultant
Roben Manufacturing, Inc.

Gary Grubert

VP, Sales & Marketing
Gasket Resources, Inc.

Dale K. Heffner

Vice President
Electro Chemical Engineering & Manufacturing Co.

Tom E. Henke

Senior Corrosion Specialist
Albemarle Corporation

Merv Howells

Principal Engineer – Materials
Honeywell

David F. Jensen

Engineering Consultant
Eli Lilly and Company

James Kelly

Director of Technology
Rolled Alloys

Rolf Kirchheiner

Manager Central Technology
Development
Schmidt + Clemens GmbH + Co

Ken Kirkham

Consulting Materials Engineer
Lyondell Chemical Company

V. R. Krishnan

DY. Chief Consultant
Engineers India Limited

Frank McGlynn

Manager, Materials Technology
Falconbridge Limited

Dale McIntyre

Consultant Metallurgy
ConocoPhillips

Dennis McIntyre

Senior Project Engineer
Cytex Industries

John Melas

Metallurgical Engineer,
Inspection Department
Hellenic Petroleum S. A.

Dallas R. Moore

Consultant & Management Resource
RathGibson

Ruben Muro

Metallurgical Engineer
Corrosion Materials

Edward R. Naylor

Senior Materials Engineering Associate
Akzo Nobel Technology & Engineering

Maria J. L. Østergård

Senior Metallurgist
Haldor Topsøe

Ashok H. Rakhe

Engineering Associate
Celanese Corporation

Michael Renner

Manager Market and
Product Development
Bayer Technology Services GmbH

Harry Schrijen

Senior Material & Welding Specialist
Competence Center Manufacturing
SABIC

Robert Smallwood

Principal Consultant
Det Norske Veritas (USA), Inc.

Steven P. Springer

Senior Consultant,
Materials Engineering Technology
DuPont Company

Brian W. Tholke

Technology Section Head
Procter & Gamble Company

Elisabeth Torsner

Vice President, Technology
Outokumpu Stainless North America

John J. Warinsky

Senior Materials Specialist
3M

William R. Watkins, Jr.

Engineering Associate
Air Products & Chemicals, Inc.

Clay White

Principal Engineer
The Equity Engineering Group, Inc.

Gary S. Whittaker

Senior Materials Engineering Associate
Eastman Chemical Company

James D. Willis

Technical Manager Materials Engineering
MeadWestvaco Corporation

Kelly Wyrough

Director of Technical Services
The Roberts Company

The Technical Forum

The Technical Forum, an open discussion period that occupies one-third to one-half of each of the three yearly meetings of the Technical Advisory Council (TAC) has become a real-time resource for members on the MTI web site, www.mti-global.org.

Members needing help with an urgent technical issue may submit a post to the online forum and receive responses within hours. The new topics and responses submitted between meetings online are compiled for further discussion at the TAC meetings and new topics are invited.

When the minutes have been edited, the new batch of topics and replies become part of the archived forum on the web site, a widely used resource for members researching a particular problem. This archive goes back to 1981 and includes all the topics discussed since the 15th TAC meeting.

The forum truly reflects that MTI maximizes resources through a global network of materials specialists. Members of the TAC possess a wide range of training, experience, and viewpoints. The active, uninhibited discussions online and at the meetings provide insights and ideas of substantial value to the participants.

Topics considered in the Technical Forum cover a very wide range, including specific materials problems, safety and health considerations of value to others, and new products or services which are (or may be) of use to materials engineers. The subjects discussed are often considered as possible MTI projects. Many MTI projects have developed from discussions at the Technical Forum.

Current MTI Activity by Technology Area

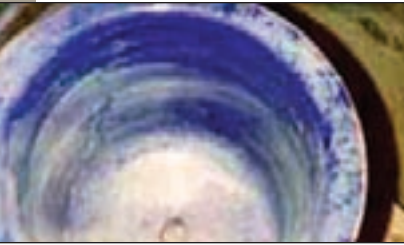


Figure 1



Figure 2

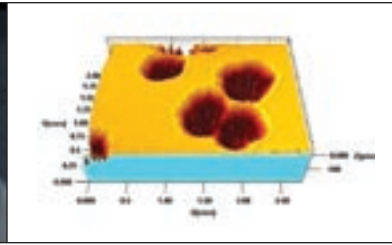


Figure 3

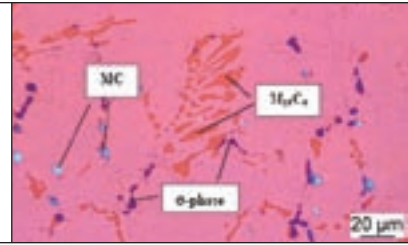


Figure 4

Non-metallic Materials of Construction:

- Evaluation & Specification of Elastomers
- Guide for Design, Manufacture, Installation & Operation of FRP Flanges & Gaskets
- Pedigree for Non-Metallic Materials
- Supply Chain Management for Elastomers
- User's Guide for Evaluating New High Tech Polymeric Materials
- Guide for Damage Assessment and Repair of FRP Equipment
- Guide for Damage and Repair of Lined Equipment
- Guide for Damage Assessment and Repair of Thermoplastic Structures
- Flame Spraying of Polymers
- Repair and Damage Assessment of Glass Lined Equipment (Fig. 1)
- Failure Analysis of Polymers
- RBI for Polymeric Materials
- Remote Visual Inspection of Refractory Lined Vessels

Training

- Managing Corrosion with Fluoropolymers
- Application of Ceramics as MOC in the CPI
- Reactive Metals
- Stainless and Nickel Alloys
- New and Emerging NDE Methods
- E-learning Program for Recognizing Corrosion
- Instrumented RR Tank Car Flange Joint Integrity
- Embedded Sensors in Polymer Equipment
- TAC Technical Bulletins
- Risk Based Inspection
- Alloy Selection System for Elevated Temperatures

NDE (Non-Destructive Evaluation)

- Statistical Analysis of NDE Data
- Embedded Sensors in Polymer Equipment
- Casting Quality Prediction
- Direct Assessment of Above Ground Piping (Fig. 2)

High Temperature

- Information System to Assess and Predict Corrosion of Metals and Alloys in Complex High Temperature Gaseous Conditions
- Detailed Investigation of the Mechanisms Controlling Metal Dusting (Fig. 3)
- Demonstration of Energy Efficient Ethylene Furnace Tubes Based on Advanced Intermetallic Alloys
- Development of a Program for the Accurate Prediction of Corrosion of Commercial Alloys in Complex High Temperature Gases
- An Atlas of Microstructures to Document the Effect of High Temperature Service on Structure of Furnace Tubes (Fig. 4)

Ceramic & Refractory Materials

- Repair & Damage Assessment of Glass Lined Equipment
- Chemical Degradation of Refractories
- Ceramic Fiber Insulation
- Remote Visual Inspection of Refractory Lined Equipment



Figure 5



Figure 6



Figure 7



Figure 8

Mechanical Integrity & Equipment Reliability:

- Risk Based Inspection Program
- Cooperative program with ASME & API on Benchmarking Temporary Repairs
- A Reliability Manual for Instruments in Chemical Plants and Refineries (Fig. 5)
- Flange Makeup Procedures for Rail Tank Car Connections (Fig. 6)
- Valve Casting Specifications
- Welding of Clad Titanium Plate
- Designing Equipment for Ease of Inspection and Improved Reliability.
- Procedures for Dealing with Failures of Fixed Equipment
- MRO Vendor Audits
- API Joint In-Service Inspection Code
- Incident Assessment and Expansion of Manual on Fire and Explosion Damage
- Casting Quality Prediction (Fig. 7)
- Continuing Risk Based Inspection Program

Other Projects

- Preparation of ASTM Standards for Gasket Test Methods
- Corrosion Data in Complex Mixtures of Acids for Input Into and Validation of Predictive Models and Expert Systems Being Developed
- Titanium Property Database of Samples Collected From All over the World to be Used to Update the ASTM Specifications for Unalloyed Titanium
- Materials of Construction for Transport Containers
- Identify the Cause of and the Mechanisms of Rouging (Fig. 8)
- Characteristics of Nanoparticles
- Titanium Hydriding
- Revision of Publication on Chemical Cleaning of Equipment
- Hexavalent Chromium Regulations
- Hurricane Damage Remediation
- Linking Corrosion Testing with Modeling
- Development of Alloy Resistant to Metal Dusting
- Materials Selector for Organic Solvents

Fiber Reinforced Plastic Flange Design

Over the last several decades, the use of fiber-reinforced plastic (FRP) materials in piping systems has been increasing due to their corrosion resistance, low maintenance cost, and relative long life expectancy. Although these attributes offer distinct advantages over traditional metal materials, FRP materials are more complex than metals, consequently design and installation of FRP structures are more involved. As FRP materials for piping systems increase in popularity, procedures and guidelines for the design and construction of components, such as FRP flanges, continue to develop. The purpose of this guidebook is to provide an accessible, comprehensive review of current procedures and best practices for the design, manufacture, installation and maintenance of FRP flanges.



Financial Statements — June 30, 2006 and 2005

STATEMENTS OF FINANCIAL POSITION JUNE 30, 2006 AND 2005

	<u>ASSETS</u>	
	<u>2006</u>	<u>2005</u>
CURRENT ASSETS		
Cash and cash equivalents	\$ 2,681,566	\$ 2,378,825
Accounts receivable	2,626	45,722
Accrued interest receivable	29,583	22,294
Prepays and deposits	17,496	14,874
Publications inventory	<u>79,239</u>	<u>78,533</u>
Total Current Assets	<u>2,810,510</u>	<u>2,540,248</u>
PROPERTY AND EQUIPMENT		
Equipment	60,911	88,215
Less accumulated depreciation	<u>46,188</u>	<u>73,774</u>
	<u>14,723</u>	<u>14,441</u>
TOTAL ASSETS	<u>\$ 2,825,233</u>	<u>\$ 2,554,689</u>
<u>LIABILITIES AND NET ASSETS</u>		
CURRENT LIABILITIES		
Accounts payable	\$ 7,734	\$ 14,346
Total Current Liabilities	7,734	14,346
DEFERRED REVENUE	<u>626,500</u>	<u>557,150</u>
Total Liabilities	634,234	571,496
NET ASSETS		
Unrestricted	<u>2,190,999</u>	<u>1,983,193</u>
TOTAL LIABILITIES AND NET ASSETS	<u>\$ 2,825,233</u>	<u>\$ 2,554,689</u>

See notes to the financial statements.

STATEMENTS OF ACTIVITIES FOR THE YEARS ENDED JUNE 30, 2006 & 2005

	<u>2006</u>	<u>2005</u>
UNRESTRICTED NET ASSETS		
Revenues		
Membership dues	\$ 1,212,900	\$ 1,109,050
Interest	104,496	89,242
Publication income	33,648	13,599
Other income	<u>500</u>	<u>13,400</u>
	<u>1,351,544</u>	<u>1,225,291</u>
Expenses		
Cost of publications	55,540	60,722
Insurance	26,397	25,935
Meeting expenses	69,736	43,903
Membership development	32,883	29,217
Office supplies	35,692	38,902
Payroll taxes	42,332	34,072
Postage	10,663	13,867
Printing	10,074	6,981
Professional services	28,224	20,760
Projects	439,685	663,979
Provision for depreciation	8,390	6,956
Rent	24,386	22,218
Retirement plan contributions	18,558	8,432
Salaries	260,110	206,143
Taxes and licenses	704	325
Technology transfer	8,547	11,277
Telephone & communications	15,666	36,896
Travel	<u>56,151</u>	<u>67,134</u>
	<u>1,143,738</u>	<u>1,297,719</u>

INCREASE (DECREASE) IN UNRESTRICTED

NET ASSETS	207,806	(72,428)
NET ASSETS – BEGINNING	<u>1,983,193</u>	<u>2,055,621</u>
NET ASSETS – ENDING	<u>\$ 2,190,999</u>	<u>\$ 1,983,193</u>

See notes to the financial statements.

Independent Auditor's Report

To the Board of Directors
Materials Technology Institute, Inc.

We have audited the accompanying statements of financial position of Materials Technology Institute, Inc. (a non-profit organization) as of June 30, 2006 and 2005, and the related statements of activities and cash flows for the years then ended. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Materials Technology Institute, Inc. as of June 30, 2006 and 2005, and the changes in its net assets and its cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

WRIGHT, CRISCIONE & COMPANY, LLC
Certified Public Accountants
St. Louis, Missouri
September 6, 2006

STATEMENTS OF CASH FLOWS FOR THE YEARS ENDED JUNE 30, 2006 AND 2005

	<u>2006</u>	<u>2005</u>
CASH FLOWS FROM OPERATING ACTIVITIES		
Collections from operations	\$ 1,359,494	\$ 1,151,123
Interest collected	97,207	91,848
Cash paid to suppliers and employees	<u>(1,145,288)</u>	<u>(1,268,388)</u>
NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES	<u>311,413</u>	<u>(25,417)</u>
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchase of property and equipment	<u>(8,672)</u>	<u>(10,956)</u>
NET CASH (USED) BY INVESTING ACTIVITIES	<u>(8,672)</u>	<u>(10,956)</u>
NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS	302,741	(36,373)
CASH AND CASH EQUIVALENTS BEGINNING OF YEAR	<u>2,378,825</u>	<u>2,415,198</u>
CASH AND CASH EQUIVALENTS END OF YEAR	<u>\$ 2,681,566</u>	<u>\$ 2,378,825</u>
See notes to the financial statements.		
RECONCILIATION OF CHANGE IN NET ASSETS TO NET CASH PROVIDED BY OPERATING ACTIVITIES		
	<u>2006</u>	<u>2005</u>
CHANGE IN NET ASSETS	\$ 207,806	\$ (72,428)
ADJUSTMENTS TO RECONCILE CHANGE IN NET ASSETS TO NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES		
Depreciation	8,390	6,956
Increase in reserve for inventory obsolescence	10,374	58,847
(Increase) decrease in:		
Accounts receivable	43,096	(4,376)
Prepaid expenses	(2,622)	(4,974)
Other receivables	(7,289)	2,606
Publication inventory	(11,080)	(17,644)
Increase (decrease) in:		
Accounts payable	(6,612)	(13,854)
Deferred revenues	<u>69,350</u>	<u>19,450</u>
NET CASH PROVIDED (USED) BY OPERATING ACTIVITIES	<u>\$ 311,413</u>	<u>\$ (25,417)</u>

See notes to the financial statements.

Notes to the Financial Statements —

June 30, 2006 and 2005

NOTE 1) SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

This summary of significant accounting policies is presented to assist in understanding the Organization's financial statements. The financial statements and notes are representations of management who is responsible for their integrity and objectivity. These accounting policies, unless otherwise noted, conform to generally accepted accounting principles and have been consistently applied in the preparation of the financial statements.

Nature of Operations: The Organization was incorporated under the name Materials Technology Institute of the Chemical Process Industries, Inc. on December 13, 1976 pursuant to the laws of the State of New York as a tax exempt organization under IRS Code Section 501c(6) to engage principally in the business of sponsoring research projects for the chemical process industries. Effective December 4, 2003, the Organization changed the name of the Organization to Materials Technology Institute, Inc. The Organization extends credit to its members for sales of publications. The member companies are located in various countries.

Cash and Cash Equivalents: For purposes of the financial statements, the Organization considers certificates of deposits, with various dates of maturities, to be cash equivalents. This includes certificates totaling \$2,041,000 maturing after one year.

Allowance for Doubtful Accounts: An allowance for doubtful accounts has not been established as it is the Organization's policy to use the direct write-off method for accounts deemed uncollectible.

This method is not in conformity with generally accepted accounting principles, but this departure does not materially affect operating results, and accordingly,

the Organization has not provided for anticipated losses.

Prepaid Expenses: Prepayments of expenses clearly related to future periods are considered as deferred charges and are not charged against current earnings.

Deferred Income: Membership income is received in advance. Accordingly, membership income is earned ratably over the period, with the unearned portion shown as deferred income at the balance sheet date.

Inventories: The Organization maintains an inventory of publications which report the results of its research projects. Direct costs of editing and production are capitalized and a unit value is established for each publication. Inventories are stated at the lower of cost or market with cost being determined by the first-in, first-out method. Company management has ascertained that the inventory of publications is subject to obsolescence due to advances in technology and other factors affecting the industries it serves. Accordingly, management has elected to establish a reserve for obsolescence with respect to ascertaining the realizable fair market value of its publications. The Organization took a charge of \$10,374 in the year ended June 30, 2006 to increase this reserve.

Inventories at June 30, 2006 and 2005 consisted of the following:

	<u>2006</u>	<u>2005</u>
Finished publication inventory	\$ 148,460	\$ 137,380
Less reserve for obsolescence	(69,221)	(58,847)
	<u>\$ 79,239</u>	<u>\$ 78,533</u>

Property and Equipment: Property and equipment are recorded at cost. Depreciation is provided using the straight line method. Repairs and

maintenance, which do not improve or extend the useful life of the asset, are expensed in the year incurred.

The useful lives of property and equipment for the purposes of computing depreciation are:
Equipment 5 – 7 years

Depreciation expense for the years ended June 30, 2006 and 2005 was \$8,390 and \$6,956, respectively.

Employee Benefit Plan: The Organization maintains a qualified savings plan under Internal Revenue Code section 401(k) for employees who meet certain age and length-of-service requirements. Subject to statutory limits, qualifying employees may elect to defer a portion of their salary. Prior to January 1, 2004, the Organization did not provide for matching or profit sharing contributions. The Plan was amended on January 1, 2004 to provide a 100% matching contribution of employee deferrals not to exceed 1% of eligible compensation. The Organization amended this formula effective January 1, 2005 to include a 50% match of employee deferrals between 1% and 5% of compensation, thereby increasing the total match to a maximum of 3%. The Organization amended this formula effective January 1, 2006 to include a 100% match of employee deferrals not to exceed 5% of compensation. Matching contribution expense totaled \$18,558 and \$8,432 for the years ended June 30, 2006 and 2005, respectively.

Federal Income Taxes: The Internal Revenue Service has ruled that the Organization is a tax exempt organization as defined under Section 501(c)(6) of the Internal Revenue Code. Accordingly, no provision for federal income taxes has been made in the financial statements.

Schedule of Annual Membership Dues for 2007

Use of Estimates: The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results could differ from those estimates.

NOTE 2) LEASE OBLIGATIONS

At June 30, 2006, the Organization was obligated under non-cancelable operating leases for its office facilities and certain office equipment which expire in March, 2007 and May, 2011, respectively. Future minimum rental payments under the leases are as follows:

Year ended June 30,	Offices
2007	\$ 17,520
2008	—
2009	—
2010	—
2011	—
	<u>\$ 17,520</u>

Year ended June 30,	Office Equipment
2007	\$ 5,064
2008	4,841
2009	4,841
2010	4,841
2011	4,841
	<u>\$ 22,815</u>

Year ended June 30,	Total
2007	\$ 22,815
2008	4,841
2009	4,841
2010	4,841
2011	4,841
	<u>\$ 40,335</u>

NOTE 3) COMMITMENTS

The Organization is a party to several research projects requiring payments of approximately \$420,000 over the life of existing projects.

2006 Annual Sales (US\$ Billions)	Year 2007 Dues - US\$	2006 Annual Sales (US\$ Billions)	Year 2007 Dues - US\$
Sales < 0.2	\$ 9,600	100 < Sales < 200	\$ 45,400
0.2 < Sales < 0.4	\$ 13,200	200 < Sales < 400	\$ 48,900
0.4 < Sales < 0.8	\$ 16,700	400 < Sales < 800	\$ 52,500
0.8 < Sales < 1.5	\$ 20,300	800 < Sales < 1,500	\$ 56,100
1.5 < Sales < 3.0	\$ 23,900		
3.0 < Sales < 6.0	\$ 27,500		
6.0 < Sales < 12.0	\$ 31,000		
12 < Sales < 25	\$ 34,600		
25 < Sales < 50	\$ 38,200		
50 < Sales < 100	\$ 41,800		

A formula is used to determine the annual dues for engineering, design, and construction firms. Please contact the MTI office for specific information.

Basis for Assessing Company's Membership Dues

Dues for membership are generally based upon the total sales of the member company and its affiliates. Dues for specific classes of members are as follows:

Producers: Dues for Producer members will be determined from the established dues schedule and will be calculated on the basis of the most recent audited Corporate CPI sales. For privately held corporations, the total corporate sales of units related to the CPI must be certified by an officer.

Suppliers: Dues for Supplier members will be determined from the established dues schedule and will be based on the most recently audited total sales

of the corporation, or portion of the corporation, which could in theory benefit from MTI membership. For privately held corporations, the total corporate sales of units related to the CPI must be certified by an officer.

The Board of Directors may make exceptions to this policy in cases where, in its judgement, the affiliates of the applicant, even though they are related to the chemical processing industry, cannot reasonably be expected to benefit from the membership in MTI.

Association memberships will be considered on a case-by-case basis, with regard to acceptance, dues levels, and conditions of membership.

About Materials Technology Institute

The Materials Technology Institute, founded in 1977, is a unique, not-for-profit technology development organization representing private industry. It sponsors projects focused on both developing new technology and transferring existing knowledge to day-to-day practice. Practical, generic, nonproprietary studies are conducted on the selection, design, fabrication, testing, inspection, and performance of materials of construction used in the process industries. The scope of work includes evaluation of metallic, and non-metallic materials, optimum design applications, fitness-for-service, mechanical integrity and life cycle determinations, and economic factors affecting performance of vessels, tanks, piping and other components.

Through membership and networking within MTI, companies can access solutions to nonproprietary problems of major concern to the process industries. Members can capitalize on the extensive expertise of member company representatives, leverage their technology investment by participating in the direction and results of MTI projects, and utilize MTI's books, reports, software and video training programs immediately as needed. Benefits to member companies are increased plant integrity, reliability and profitability.



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