



STEEL'S PREMIER TECHNOLOGY EVENT

AISTech 2015 & ICSTI RETROSPECTIVE





Iron & Steel 2015: Today's Challenges. Tomorrow's Opportunities.

On the shore of Lake Erie, steel producers, suppliers, executives, academics and students from around the world convened at the Cleveland Convention Center in Cleveland, Ohio, USA, for AISTech 2015 — The Iron & Steel Technology Conference and Exposition. Held on 4–7 May 2015, AISTech 2015 returned to Cleveland after a nine-year absence to the new convention center that was completed in 2013. The event drew 7,690 attendees from 41 countries, which established a new record for the highest attendance outside of Pittsburgh.

Despite the challenges facing steelmakers today, the commitment to seizing the opportunities of tomorrow was strong, with a record-breaking number of exhibitors for the second year in a row.



Golf Classic

AISTech 2015 kicked off with the AIST Foundation's annual Golf Classic. Held this year at Firestone Country Club, players enjoyed some of the finest golf of any private club in the country. Thanks to the generous support of eight corporate sponsors, 288 golfers participated in a beautiful day of golf on Sunday, 3 May.

The AIST Foundation sponsors various programs and scholarships that help to ensure the steel industry of the future has a sufficient number of qualified professionals. The Foundation wishes to thank all of the sponsoring companies as well as **Steven S. Hansen**, who served as Golf Committee chair. See page 126 of this issue of *Iron & Steel Technology* for a complete list of Golf Classic sponsors and contest winners. Be sure to join us next year in Pittsburgh, Pa., USA, for the next AIST Foundation Golf Classic!



Technology Conference

The technical program began on Sunday, 3 May, and attracted more than 1,800 attendees from 35 countries. This year's technology conference matched AISTech 2014's record of 515 technical presentations. Over the course of the four-day program, a wide range of cutting-edge processes and technology advancements were presented, including everything from coke production to process lines, with a whole lot in between!

AISTech 2015 was host to ICSTI 2015 — The International Congress on the Science and Technology of Ironmaking. The ICSTI program covered fundamental issues encompassing physical chemistry, kinetics, morphologies, mathematical models and technical matters, including traditional and alternative raw

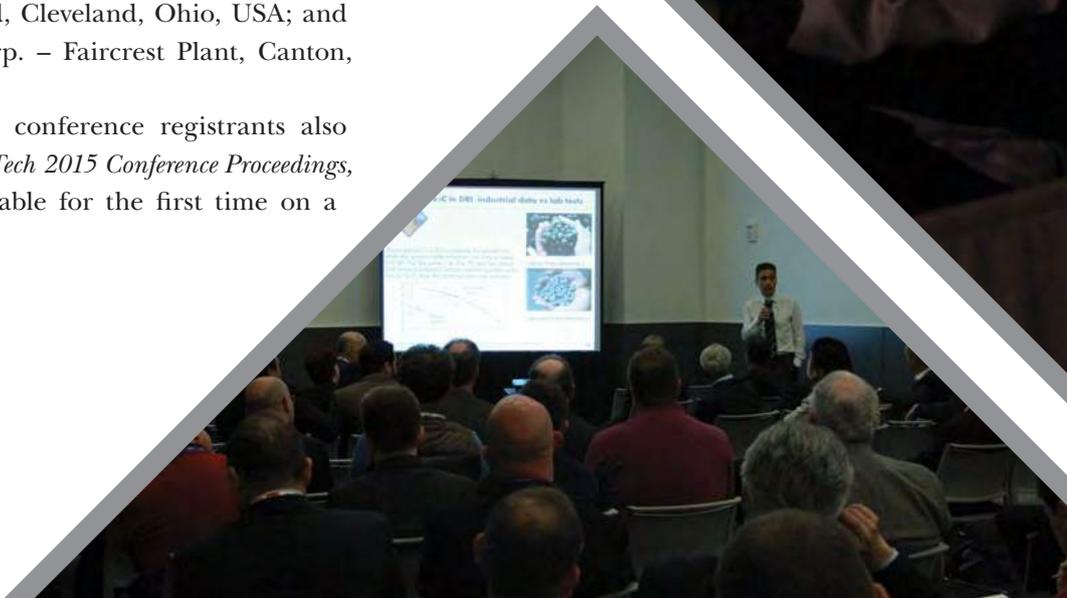


materials, biomasses, conventional technologies, emergent processes and environmental addresses in ironmaking. The ICSTI program began on Sunday, 3 May, with a session entitled “Ironmaking Across the Globe,” which drew 115 attendees.

On Monday morning, 4 May, the Howe Memorial Lecture was given by **Dr. Yakov Gordon**, technical director, ironmaking, Iron and Steel Business Unit, Hatch Ltd. Dr. Gordon’s lecture was titled “The Role of Engineering Consultancy in the Transformation of a Technology Idea to a Working Process Plant.” Approximately 250 people attended the lecture, in which Dr. Gordon described how consulting engineers help companies go through the various stages of implementing new technologies, from research and development, to the laboratory scale, to pilot plants and then to full commercial ramp-up. Dr. Gordon’s lecture appears on pages 67–79 of this issue of *Iron & Steel Technology*.

The technology conference included three plant tours to local facilities on Thursday, 7 May: ArcelorMittal Cleveland and Charter Steel – Cleveland, Cleveland, Ohio, USA; and TimkenSteel Corp. – Faircrest Plant, Canton, Ohio, USA.

All technology conference registrants also received the *AISTech 2015 Conference Proceedings*, which were available for the first time on a USB drive.



★ STEEL'S PREMIER TECHNOLOGY EVENT

AISTech[®] 2015 & ICSTI KEY STATISTICS

TOTAL AUTHORS

1,754

TOTAL ATTENDANCE

7,690

PLANT TOUR
ATTENDEES

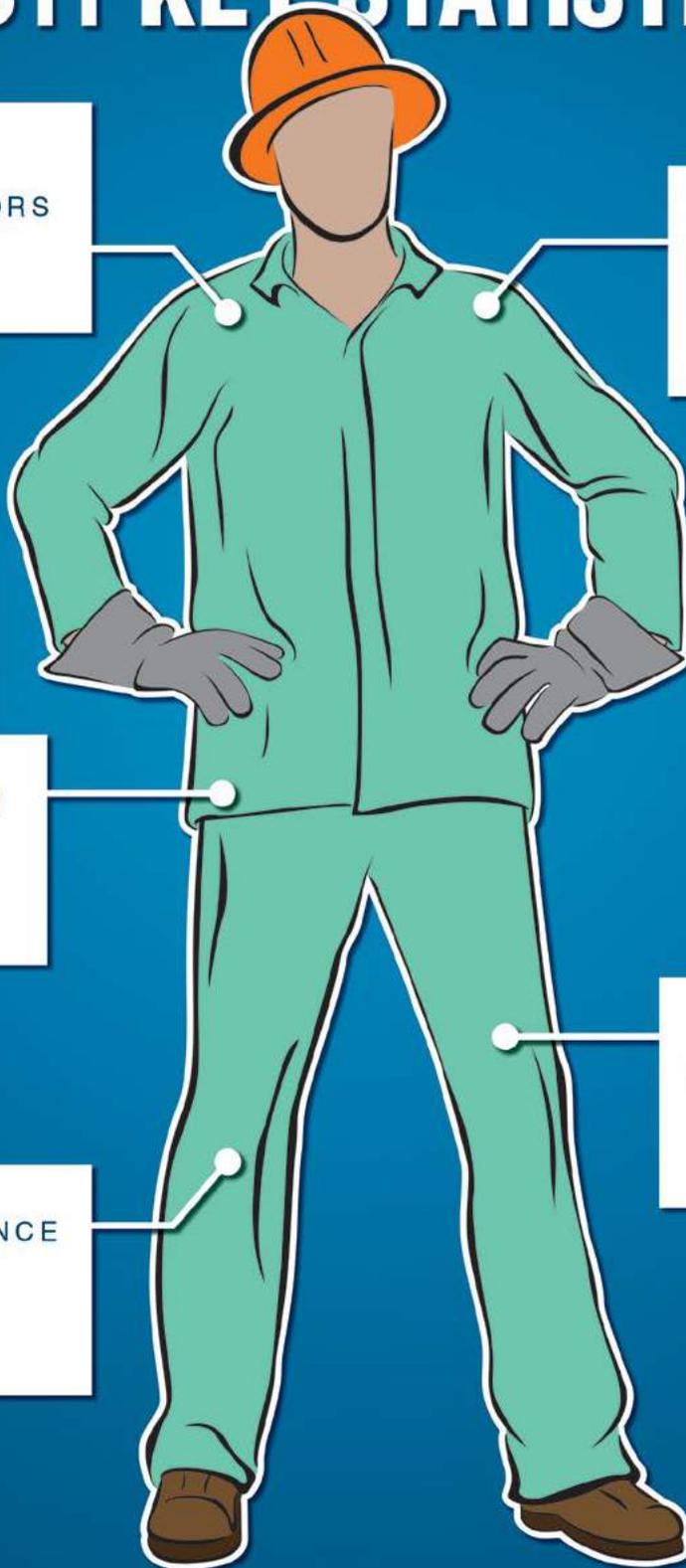
300

STUDENT ATTENDEES

170

FULL CONFERENCE
ATTENDEES

1,892



TECHNICAL

SESSIONS

110



PRESENTATIONS

515



COUNTRIES REPRESENTED

41

TOTAL EXHIBITING COMPANIES

541



TOTAL EXHIBIT SPACE

96,400 SQ. FT.



HOWE
MEMORIAL
LECTURE

250

TOWN
HALL
FORUM

800

PRESIDENT'S
AWARD
BREAKFAST

1,014



AISTechn[®]



AIST
ASSOCIATION FOR IRON & STEEL
TECHNOLOGY



Exposition

Building on the successes of the last several years, AISTech 2015 set a new record for total square footage. With 96,400 square feet (8,690 m²) of net exhibit space, attendees were afforded the opportunity to visit 541 exhibitors from all over the world. The objective of AISTech is to support the steel industry by providing networking and educational opportunities to advance steel manufacturing technology. The exhibit floor serves as a platform for attendees to learn from a diverse group of experts representing companies, products and services for the global steel industry.

A highlight on the show floor was the Chevy™ Silverado Truck Giveaway. This year's Chevy™

Silverado winner was **John Accurso** of Quaker Chemical Corp.

Other prizes given away at AISTech 2015 included a set of golf clubs and bag, large-screen TV, a Microsoft Surface tablet, and an iPad. The AIST Service Center carried the *AISTech 2015 Conference Proceedings*, as well as AISTech 2015 T-shirts and other publications for sale, and attendees were able to enter in raffles and sign up for AIST membership. All AISTech 2015 prize winners are recognized on page 127 of this issue.



President's Award Breakfast

On Tuesday morning, 5 May, the 2014–2015 AIST president **Glenn Pushis** hosted the President's Award Breakfast in the Grand Ballroom at the Cleveland Convention Center.

Pushis spoke about his year as AIST president, the role of company culture, safety and leading through innovation to build a sustainable enterprise. He particularly addressed the issue of workforce development, as this is where AIST can make a difference. “The skills gap alone is a monumental challenge for the steel industry — not just in North America, but globally,” said Pushis. “The solution is creating a strategic plan for workforce development. Technical training is clearly one area where AIST can help. With

our extensive curriculum, AIST is well positioned to help companies develop a well-trained and connected workforce. A workforce that can solve problems and get things done. And I look forward to AIST continuing to lead and innovate with workforce development programs.”

Pushis talked about the collaboration between AIST and the Center for Innovation Through Visualization and Simulation at Purdue University Calumet, which has



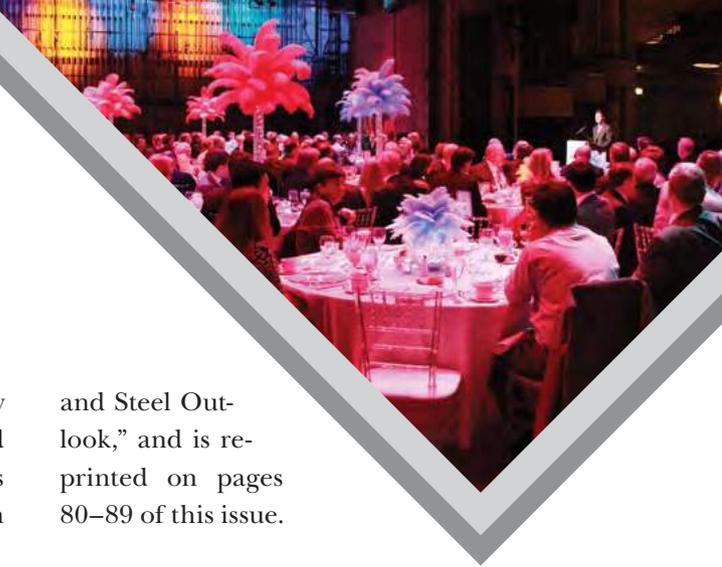


joined forces with 15 steel companies and organizations to launch an industry-led steel consortium that will focus on innovative solutions to advance steel manufacturing competitiveness.

Finally, he indicated that AIST is financially strong, with a large membership base, and new or recent initiatives to serve our members, including: a free initial year of Young Professional membership, a corporate dues renewal option, the growing AIST Process Benchmark[®], the AIST Digital Library, the Emerging Leaders Alliance, the AIST Italy Steel Forum, the International Steel Academy, additional volumes of *The Making, Shaping and Treating of Steel*[®] book series, the successful Matching Funds Program for donations to the AIST Foundation, many upcoming conferences and training programs such as Galvatech/CHS², and finally the 10 semi-finalists for the inaugural T.C. Graham Prize.

Mario Longhi, president and chief executive officer, United States Steel Corporation, was selected as AIST 2015 Steelmaker of the Year. Longhi was recognized as a transformative leader dedicated to the safety and well-being of employees and affiliates of the company and as a “champion of change” who drives performance through innovation, inspiration and human capability. Accepting his award, Longhi said, “It is a true honor to stand before you and represent U. S. Steel. When you honor myself and U. S. Steel, all of our organizations are honored. We represent not just the steel industry but the resilience of our people and our economies to thrive. I have no doubt that what we do is critical to the future of a successful economy... what you do every day means something to the lives of others and is the measure of a good life: a life that matters.”

A Q&A with Mario Longhi appears on pages 118–122 of this issue.



The keynote presentation was given by **Lourenco Goncalves**, chairman, president and chief executive officer, Cliffs Natural Resources Inc. Goncalves' address was titled "Global Iron

and Steel Outlook," and is reprinted on pages 80–89 of this issue.



President's Welcome Reception and Dinner

On Tuesday evening, 230 invited guests gathered at the State Theatre at Playhouse Square for the annual AIST President's Welcome Reception and Dinner. Each year, this event recognizes the outgoing members of the board of directors and the AIST Foundation board of trustees for their service to the association.

Recognition was given to numerous leaders of AIST's international Member Chapters, as well as the individuals who received Presidential Citations: **Douglas D. Nicksch** of Mi-Jack Products Inc., for his commitment to AIST as the education chair for two of AIST's Technology Committees; **Jose H. (Junior) Noldin Jr.** of Lhoist Group, for his service as the AIST-ABM liaison; and **Charles A. Totten** of T&M Equipment Co., for his unending dedication, leadership and commitment to AIST as evidenced by the success of the 2014 AIST-IAS Crane Symposium in Argentina.

Finally, **George Koenig**, the incoming AIST president, thanked Glenn Pushis for his service to AIST over the previous year and throughout his tenure on the executive committee since 2010. Koenig mentioned Pushis' work to strengthen the organization and his own hope to continue to build upon AIST's core training programs in both North America and abroad. Koenig spoke about having a greater physical

presence in the mills and discussing AIST's programs directly with the employees who could benefit. "In the future," said Koenig, "I would like to see AIST work with academic institutions to have training certifications that are accredited by universities. AIST has demonstrated the capability to train and to educate, and for young workers in their 20s or 30s, a training certificate program could be extremely attractive."

Over the next 12 months, Koenig will work to evolve the T.C. Graham Prize; AIST's international growth strategy in places such as India, Mexico and Italy; and collaboration with other organizations like the Steel Manufacturers Association.

AIST would like to thank the dinner sponsors, Sarralle, Quaker Chemical Corp., Tenova and MTUS Technology.





AISTech

WORKFORCE DEVELOPMENT

With an improved safety culture, why are fatalities on the rise?



Town Hall Forum

The 2015 Town Hall Forum took place on Wednesday, 6 May. The five panelists were: **Andrew Harshaw** of ArcelorMittal USA, **George Koenig** of Berry Metal Company, **Michael Lee** of Nucor Steel-Decatur LLC, **David Rintoul**

of United States Steel Corporation, and **Dick Teets** of Steel Dynamics Inc. John Delano of KDKA-TV (CBS), Pittsburgh, moderated the discussion, which focused on the theme, “Steel 2015: Building! Innovating! Growing?”

A “Brutal” Market

The discussion began on the overall state of the American economy and the state of the steel industry in particular. Brutal market conditions had been hinted at by Mario Longhi of U. S. Steel just a week earlier. Delano asked the panelists, “How bad is it, really?”

Harshaw was first to reply. “The American economy is very healthy, but the steel industry isn’t,” he said. “The difference is imports.”

Lee, who claimed he is typically an optimist, said, “It doesn’t look good. Today, for all the steel sold in the United States, 35% comes from outside the U.S. On the flat roll side alone, from 2013 to 2015, we are importing an additional 6 million tons into our economy. The government needs to do something about trade and currency manipulation issues. We have the best and brightest. We can compete with anyone. We have the know-how and wherewithal to make it happen. But only on a level playing field.”

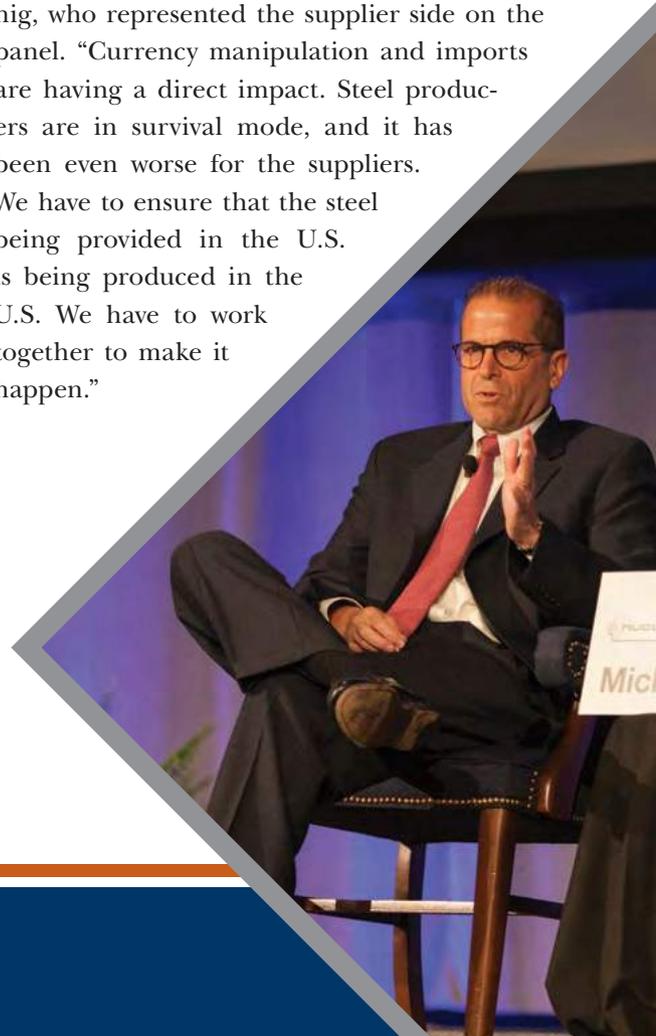
The economy was indeed on an upswing a year prior, and the steel industry had been enjoying those improvements via steel tube production for the energy sector. Yet according to Teets, imports were still a large portion of that market. He echoed Lee’s comments by saying, “We need to lay the groundwork for the proper

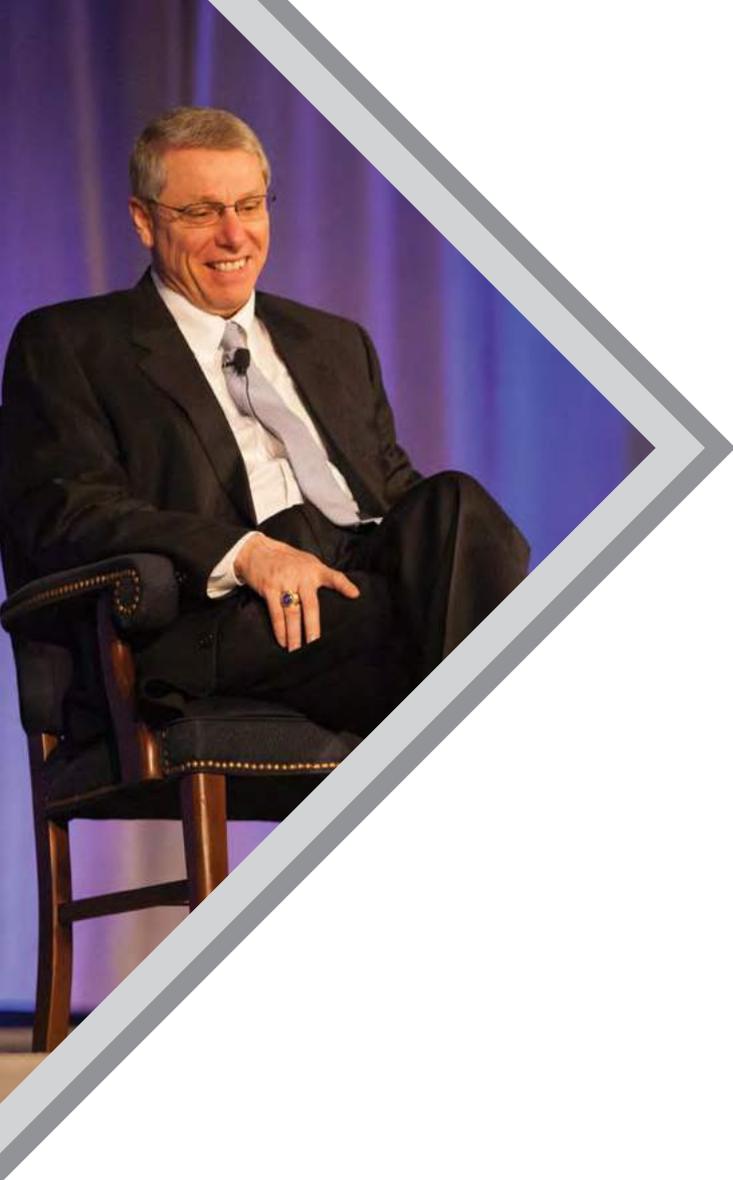
definition of fair trade. We are not looking for protection but fairness.”

To remain competitive, both suppliers and producers have had to innovate. “Our business is not for the faint of heart,” stated Rintoul. “The current situation illustrates that.”

“It’s an absolute war out there,” claimed Koenig, who represented the supplier side on the panel. “Currency manipulation and imports are having a direct impact. Steel producers are in survival mode, and it has been even worse for the suppliers.

We have to ensure that the steel being provided in the U.S. is being produced in the U.S. We have to work together to make it happen.”





Workforce Development

The innovation the steel industry needs in the face of its challenges will of course originate with its people. However, every day, approximately 10,000 baby boomers are retiring, often taking early retirement. Delano put forth to the panel that, in 2015, one-third of the U.S. workforce and nearly half of all supervisors will be eligible to retire. He inquired, “How are you preparing for the next generation of workers and leaders in steel?”

Steel producers have seen this coming and have been preparing for it. ArcelorMittal has been running the “Steelworker of the Future” program for several years in conjunction with 10 local colleges, and about 93% of the graduates go on to be ArcelorMittal employees. “It’s a big problem,” said Harshaw. “We’re approaching the edge of a cliff in the next five years, when 40% of our hourly staff will retire. We need to get involved with high schools and get young people to make choices early on and to inspire them as we were inspired.”

But what inspires young people to pursue a career in steel? There are two hurdles: one of perceptions and one that’s generational. Many Millennials — the 80 million people between the ages of 18 and 35 who will make up half of the American workforce by 2020 — still perceive the industry as difficult and dirty. “Some people don’t think we still make steel in the U.S.!” exclaimed Lee. “This is our focus when we deal with universities. There is a severe and critical need for attracting people to our workforce, so we do a lot of work to change the perception of our grandfathers’ industry. It is highly technical now.”

Tech-savvy Millennials would not be afraid of such an industry, but there is a generational divide as well. Those hiring at steel manufacturing plants may not be as well-versed in social media or care as





much about the various causes to which young people tend to devote a lot of their free time. Delano said, “A lot more than a job is important to them.”

Yet the jobs are out there — steel companies are hiring people who want to be involved, engaged and make a difference. “Every generation is different,” explained Rintoul, “but through our Carnegie Way initiative, we’re doing a better job of making sure people are more involved and have a part in what we do and how we do it.”

All the panelists agreed that Millennials will bring the newest technology that the steel industry needs to meet its challenges, but hard work is

still part of the job.

“The steel industry is a great place to work and raise a family,” said Koenig. “If you work hard every day, have a good attitude and stay focused, you will do good for your company, your family and yourself.”

Safety

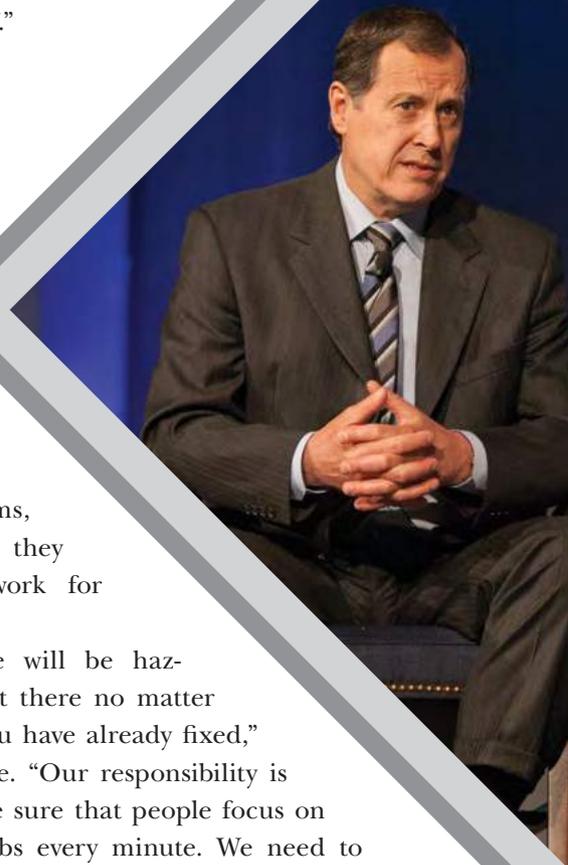
The next topic in the discussion was safety. “No one wants to work for a company that is unsafe or is perceived as such,” observed Delano. “Fatalities were up last year, and the two most recent fatalities are still under investigation. What are the greatest challenges to improving the industry’s safety record?”

At U. S. Steel, hazard recognition is key. “Just because there wasn’t an injury doesn’t mean there wasn’t danger,” Rintoul pointed out. “We aim to avoid the incident of the future. Training and cooperation are needed because there’s only one right number when it comes to safety: zero.”

“Nearly every fatality comes back to decisions that were made,” suggested Harshaw. “Usually the word ‘assume’ comes up. Checks and validations are missed. At ArcelorMittal, we’re aggressive in assuring that contractors are following

our programs, or else they won’t work for us.”

“There will be hazards out there no matter what you have already fixed,” said Lee. “Our responsibility is to make sure that people focus on their jobs every minute. We need to look at the basics.”





Imports

Starting at the President's Award Breakfast the previous day, the air at AISTech had been full of talk about imports. Delano asked the panelists, "Describe how you have been affected."

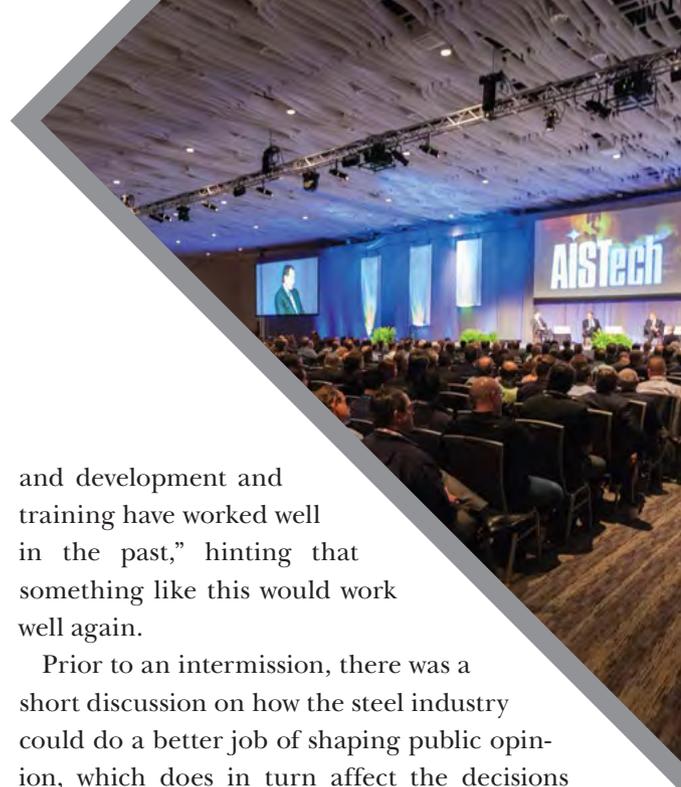
"At Steel Dynamics," according to Teets, "we are down to three crews instead of four because of the market. Equipment is available that we are not using." At Nucor, Lee said, "Every one of our markets has been impacted. Our guys on the floor are being impacted financially. I'm still an optimist, and the price of oil being up this week is good for OCTG, but it is still way worse than last year." Rintoul concurred: "OCTG demand is down by almost half. At U. S. Steel, we're feeling the effects across the entire organization, with very low operating rates."

Suppliers in turn have been affected. Koenig offered, "Our core business has been affected dramatically as a result of the plants not operating. We have to be flexible to keep the ball rolling, but our core business absolutely is off because of the imports coming into this country."

Teets, who is the current chairman of the Steel Manufacturers Association (SMA), put out a call for action, saying we "need to enforce the laws we have and make sure the definitions of injury in those laws are correct."

"Let's do something similar to Section 201," offered Lee, "which came about because half of our industry was bankrupt." But Rintoul countered, "Something has to be done soon. We can't wait till companies are bankrupt to decide they have been harmed."

Mario Longhi and other steelmaking chiefs have spent a great deal of time trying to get government officials to understand the issues. "We have to stay vigilant over the next several months to ensure they enact the necessary changes," stated Rintoul.



Infrastructure

Government decisions are also needed regarding U.S. infrastructure, most of which was built in the 1950s and '60s. In 2014, many countries were ranked higher than the United States in the general quality of their infrastructure. The panelists were asked their opinion on this major issue.

Koenig got right to the point: "Figuring out the infrastructure is a win-win. We need to get some action to happen so it benefits the country and our companies."

Rather than focusing on EPA regulations and penalizing what is already the cleanest steel industry in the world, the panelists suggested the U.S. government could do a better job of moving forward on the road programs that have been stalled in Washington. Harshaw noted, "Government partnerships with research

and development and training have worked well in the past," hinting that something like this would work well again.

Prior to an intermission, there was a short discussion on how the steel industry could do a better job of shaping public opinion, which does in turn affect the decisions made by government officials.

Following the break, attention turned to steel's competition with other materials. Rintoul indicated that the steel industry has "not won over the public awareness about how green steel is. Yet cradle to grave, it's the greenest material there is. Making steel is cleaner than making aluminum."

New Applications for Steel and the Latest Technological Successes

The final topic of the 2015 Town Hall Forum involved what steel companies are doing to develop new applications for steel. "In an effort to get ahead of the game, what are your new product lines or better way of making existing products?" asked Delano.

At Nucor, the future direction comes from a partnership with auto companies. "They know what they need in the next decade or so, and this spurs our activity," said Lee. "Berkeley can now go to 72 inches plus. We can make stronger, wider, lighter gauges."

At U. S. Steel, the most recent technological success has been in premium connection for pipe. Rintoul said, "Picture yourself in 6,000 feet of water, with a great big hole in the middle

where the pipe goes down 35,000 feet into the earth's core. It's important that that pipe stays intact; 45 feet at a time, it has to be screwed together properly and not leak. Our steel has to work in that environment."

ArcelorMittal began work some time ago to create a tougher steel for railroad tank cars. New requirements came about for tanker cars because pierce resistance became necessary. Harshaw said the company is incorporating its welding technology to develop a door ring that is now the key component in that vehicle.

Steel Dynamics has had improvements at both its Pittsboro and Butler (Ind.) locations, as well as purchasing the former Severstal Columbus mill in the past year. "We have a better



entry into automotive steels than we had before,” said Teets. “At Steel of West Virginia, we started making the bulb flat that was no longer available in North America. We brought something back into the market that would have been foreign-made. We also developed head-hardening premium rail because that market was growing.”

A question and answer period followed, in which questions emailed by the audience were fielded by the panelists.

Afterward, a Town Hall Lunch took place in the exhibit hall. The luncheon was sponsored by Berry Metal Company, Herr-Voss Stamco, Nidec, CBMM North America Inc. and REA Jet.

A video of the entire 2015 Town Hall Forum is available online at AIST.org.



Member Chapter Meetings

Over the course of AISTech 2015, leaders from AIST’s Brazil and India Member Chapters and the proposed Italy Member Chapter met with AIST representatives to discuss advances within each chapter and future programming opportunities within each region.

On Sunday, 3 May 2015, the India Member Chapter officers and representatives met with AIST staff. In 2013, a formal executive committee was established, which leads the new chapter as it continues to grow alongside the Indian steel market. During the meeting, chapter growth ideas were discussed, as well as the planning of AIST’s 2017 International Steel Academy (ISA). The 2017 ISA host will be Tata Steel.

On Tuesday, 5 May, AIST staff met with representatives from the AIST Brazil Member Chapter and Associação Brasileira de Metalurgia e Materiais (ABM) to review the current cooperation agreement between AIST and the ABM, as well as future programming opportunities in Brazil.

AIST staff met with representatives from the proposed AIST Italy Member Chapter on Wednesday, 6 May 2015. The discussion focused primarily on the Italy Steel Forum, which has been held each year since 2012. The proposed 2015 Italy Steel Forum is scheduled for 22–23 October 2015 in Dalmine, Italy. The program features an Industry Leader Town Hall Forum, a continuous casting experts’ panel discussion, pipe and tube experts’ panel discussion and keynote presentation(s). Another topic of conversation included the formal establishment of the Italy Member Chapter and its executive committee.





Students and Young Professionals at AISTech

AISTech 2015 provided special programming for students, thanks to the support of five sponsoring companies. This year, 170 students from 37 universities participated in student-related programs. For a full recap of the activities and programs held for students and young professionals at AISTech 2015, see pages 265–268.



Truck Giveaway

Congratulations to **John Accurso** of Quaker Chemical Corp. in Middletown, Ohio! Preliminary drawings were held on Monday, Tuesday and Wednesday, and the winner was drawn at 11:45 a.m. on Wednesday after the conclusion of the AISTech 2015 Town Hall Forum. We also want to thank Serpentine Chevrolet of Strongsville, Ohio for their assistance.

Thank you to all the participants in the drawing for the Chevy™ Silverado Truck giveaway. Good luck in 2016!

Truck Giveaway Sponsors:





Acknowledgments

AIST's Executive Committee and board of directors recognize the work and dedication of the AISTech 2015 Conference Planning Committee chair, **Richard E. Fash**; the Exhibitor Committee Chair, **Mark Bidoli** of Hickman, Williams & Co.; AIST Foundation president, **Fred Harnack**; the Technology Committee members who volunteered their time and effort to create the technical program; as well as those who chaired

sessions and presented papers. AIST also thanks the membership and steel industry for their tremendous support.



AISTech 2016: Pittsburgh, Pa., USA

Join us on 16–19 May for AISTech 2016 at the David L. Lawrence Convention Center in Pittsburgh, Pa., USA. In our expanded show floor, 275 companies have already signed up for more than 70,000 net sq. ft. of exhibit space. Contact the AIST Sales Team at sales@aist.org to reserve your space today — the exposition is sure to fill up quickly! Also check out AISTech 2016's numerous sponsorship opportunities, which are a great way to boost your exposure.

The deadline to submit an abstract for the technical conference is 17 August 2015. You won't want to miss out on steel's premier technology event of the year. Send your abstract to abstracts@aist.org.

