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In this issue

Issue 87 – February 2016

New ASME Journal to Focus on Clean Energy

Engineers and scientists will soon have a new journal in which to share breakthroughs with their technical communities and the world. ASME's new *Journal of Electrochemical Energy Conversion and Storage* will launch in February 2016 with a focus on a cleaner future through batteries, fuel cells and other energy conversion and storage technologies… *Read more*

Engineering with the Animals

The zoo provides endless entertainment for children and adults alike, and has become a common diversion in the US and around the globe. However, few know how much engineering goes into these facilities… *Read more*

Celebrate Your Profession: Pledge to Take Part in Global Day of the Engineer

Global Day of the Engineer, to be held on 24 February 2016, aims to bring together the international community to celebrate the accomplishments of engineers, give students around the world a chance to experience engineering, and share the amazing innovations engineers create every day… *Read more*

Inspector Drone

Drones aren't just for snooping, spying, stealth attacks from above, and pranks anymore. The oft-maligned technology is now in the business of saving lives, by going where humans can't go without taking on considerable risk… *Read more*

TRAINING and DEVELOPMENT

- Upcoming Courses
- In-company

ASME STANDARDS & CERTIFICATIONS

- Next Releases
- Conformity Assessment

ASME PUBLICATIONS

- **Book of the month Digital Library:**
  - *Introduction to Dynamics and Control in Mechanical Engineering Systems*

NEW ASME JOURNAL TO FOCUS ON CLEAN ENERGY

Engineers and scientists will soon have a new journal in which to share breakthroughs with their technical communities and the world. ASME's new *Journal of Electrochemical Energy Conversion and Storage* will launch in February 2016 with a focus on a cleaner future through batteries, fuel cells and other energy conversion and storage technologies.

The new publication replaces the Society's *Journal of Fuel Cell Science and Technology*. Under the leadership of a new and expanded editorial board, this new journal will target a fast review time while continuing to improve publication quality. This new journal reflects the latest scientific thinking on energy conversion and storage technology, and includes batteries, fuel cells, electrolysers, distributed energy, alternative fuels, carbon capture & utilisation, and solar energy.

The bi-monthly publication will report on a wide range of disciplines impacting the research and development of electrochemical energy conversion and storage systems, from fundamental electrochemistry and materials, to engineering design, analysis and manufacturing.

Peer-reviewed articles in the *Journal of Electrochemical Energy Conversion and Storage* will cover a diverse set of topics related to energy storage and conversion technologies. Topics covered include reliability, damage tolerance, safety, and environmental control – important factors for advancing the technology to the R&D and commercialisation stage.

"This is a very active research, development and commercialisation area," said Wilson K. S. Chiu, Ph.D., of the University of Connecticut, who serves as the editor for the journal. "Government and industry have challenged engineers and scientists to create new 'greener' renewable technology that can meet society's needs for energy conversion and storage. We believe this new journal will be a central source of technical information in the rapidly growing energy marketplace."

Papers for the *Journal of Electrochemical Energy Conversion and Storage* are invited from researchers, industry and government agencies. For more information, visit this page.

Back to top

ENGINEERING WITH THE ANIMALS

At Como Zoo Polar Bear Odyssey in Saint

The zoo provides endless entertainment for children and adults alike, and has become a common diversion in the US and around the globe. However, few know how much engineering goes into these facilities. Both Len Lundquist and Lewis Anderson are well aware of what goes into a successful zoo, having worked on their share of zoo projects with LKPB Engineers, Inc.

In fact, one institution they worked with quite closely was the Como Zoo, in St. Paul, Minnesota.

A big aspect of that project was working with the polar bears. "It [the habitat] was a salt-based system, so we had the challenges to work with

Paul, Minnesota. Image: LKPB Engineers

the water filtration system. There were the challenges with salt and corrosion and, with polar bears, we had to work around issues relating to cold weather," Anderson says. "This was a year-round exhibit, so piping systems and heating systems have to be able to function and pass through areas that might be subject to minus 40 [Farenheit]."

But there was also off-exhibit work that had "a den for a female polar bear to go ahead and have a cub," Lundquist explains. That required a focus on the air-handling units to maintain a temperature of around 60 degrees. "The air-handling unit is susceptible to very cold temperatures inside the unit, so we then had to specify a complete thermal grade air handling. [In warm weather] we didn't want to transfer that cold air atmosphere out to the exterior," Lundquist says. "Because the temperatures in Minnesota will get to 92 degrees with high humidity and you avoid condensation that way."

The polar bears in the off-exhibit area are sensitive to sound and they make sure if they do have rooftop air-handling systems that ventilate the area that they have sound and vibration control. "We have emergency generator backup and it's about 100 feet away from the building so they don't upset the polar bear with regard to sound and noise," Lundquist says.

But there's a quarantine area to content with, where they take mammals when they are sick or under care of a veterinarian. "For the HVAC system, you have to create the negative pressures within the holding area and the filtration is better," Lundquist says. "It's more severe or a higher percentage of filtration, like a hospital isolation room."

There are indoor exhibit areas that need dehumidification to help with the moisture, says Lundquist. "With the air-handling systems or ventilation systems, you have one for the people who are visiting the zoo and one for the off-exhibit area where the dens are because you have these odours. You don't want to transfer them from back in the house [to visitors]. In winter time, for the viewing area, we have the ability to bring in dry, cooler, outside air and that will dehumidify it."

Anderson says they also built the system to recirculate. For example, fiberglass pumps are used against corrosion. After all, you don't want salt in the city sewer and want to retain as much of it as you can from a pollution standpoint and economic standpoint. "There's a whole intricate system of filtration and backwashing to recover as much saltwater as possible and put it back into the exhibit," Anderson says.

Back to top

CELEBRATE YOUR PROFESSION: PLEDGE TO TAKE PART IN GLOBAL DAY OF THE ENGINEER

Global Day of the Engineer, to be held on 24 February 2016, aims to bring together the international community to celebrate the accomplishments of engineers, give students around the world a chance to experience engineering, and share the amazing innovations engineers create every day.

The new Global Day of the Engineer initiative is being managed by DiscoverE. ASME is a member of the DiscoverE coalition of engineering societies and other science, technology, engineering and mathematics (STEM) stakeholders. Global Day of the Engineer is one of a number of events scheduled to take place during Engineers Week 2016, which will run from 21 to 27 February.

Taking part in Global Day is easy. Simply visit the page and pledge to participate in Global Day of the Engineer by celebrating the achievements of engineers in your community or workplace, by joining in hands-on activities with students in your local area, or by sharing a photo of an engineering innovation from your geographic region on social media on 24 February.

For more information about Global Day of the Engineering, visit the DiscoverE web site.

Back to top

INSPECTOR DRONE

Drones aren't just for snooping, spying, stealth attacks from above, and pranks anymore. The oft-maligned technology is now in the business of saving lives, by going where humans can't go without taking on considerable risk.

An aerial inspection and surveying drone. Image: Cyberhawk

Industrial inspection is the niche that screams out for remotely operated aerial vehicles, as they are sometimes known. Jobs that once required people dangling from ropes, or atop precarious scaffolding, are now about as risky as playing a video game. "In the UK the largest number of industrial fatalities comes from falls from heights," says Phil Buchan, a mechanical engineer and the commercial director of Cyberhawk, Aerial Inspection and Surveying Specialists. "Our technique is reducing the need for people to work at height."

That technique involves more than sending up a GoPro on a quadrocopter controlled by an early-adopting technophile. Cyberhawk uses two highly skilled employees for every job. One is a trained drone pilot, the other a trained engineer. While the pilot controls the vehicle, the engineer controls the camera.

The engineering half of the duo may have once been an inspector or may have been trained by Cyberhawk after graduating. Pilots might be hobbyists or may come from a military background. At Cyberhawk they go through four levels of training, with only level-four pilots sent out to inspect assets in complex harsh environments such as offshore oil platforms.

The cameras Cyberhawk use can look straight up and straight down, giving them an unrestricted view of whatever might need inspecting. "We can fly under the deck of an oil platform and turn the camera and look directly up to inspect the underneath of the deck," says Buchan. "Traditionally that's an area difficult to inspect, difficult to have access to."

But these ogling RC aircraft do more than just reduce the need for dangling humans and associated risks. They can save industries serious money. For example, until now, checking a flare stack meant shutting down production. "A flare stack typically has a large flame coming out of it, so you can't send someone up there to inspect it," says Buchan. "We can do our inspection while the flare is online, and now we can do it every six months to monitor degradation." One supermajor oil and gas company said they saved $11 million by not having to shut down during such an inspection in Nigeria, thanks to a Cyberhawk team.

Inspecting an offshore rig. Image: Cyberhawk

After some 10,000 safe commercial flights in 20-odd countries, Cyberhawk has shown the world that drones are good business for cutting risk.

In the U.S., though, regulations make that business a little more complicated. Ventus Wind had to ground their inspectors when the FAA outlawed all commercial drones. “We were operating for about two and a half years without any problem,” says Marco Zvanik, the company’s CEO. “It put us out of business.”

To get back in business, the company had to jump through a fair number of hoops. They had to apply for (and received) a section 333 exemption from the FAA; all their pilots now have to be licensed pilots; a spotter must accompany all the pilots for all flights; the drones cannot fly out of the line of sight at any time; and all drone flights have to be registered with air traffic control, days in advance. But however onerous these requirements might be, it does raise the bar for entry into the business, eliminating potential amateur competition.

Whatever time and money the bureaucratic process might cost, Ventus Wind is still able to offer incredible savings to those in need of a thorough examination at a high altitude. Their cost for a single turbine inspection ($1,700) is a mere 15 percent of what it would cost to inspect in any other fashion.

The price is likely to go down—and efficiency up—as drone technology improves. With current battery technology the drones can’t stay up longer than 15 minutes. Ventus has recently put sensors on their drones to detect leaking methane, but any addition to the drone sucks up a huge percentage of a drone’s hauling capacity. “There is a lot of hardware that works on the back of a truck but is impossible to use on a drone,” says Zvanik. Advancements are needed on the software side of things too. “You can capture all the great videos and infrared you want, but you have to be able covert that to a usable format and generate a report the asset owner can actually do something with,” he says.

However much room there may be for improvement, the drone inspection business is already saving money and saving skins. “Just the other day I watched a helicopter dangling a man a 100 feet below, going from transmission tower to transmission tower looking at components,” says Zvanik. “It’s like, ok, you can do that with a human, but you can do it a lot faster and with plenty less money using a drone.”

By Michael Abrams, an independent writer for ASME.org.

Back to top

TRAINING AND DEVELOPMENT

ASME Training & Development courses for 2016

Invest in the knowledge that will bring you results and success for your job and organisation.
Register for one of the following training courses:

Register Now for Spring Courses!

Copenhagen, Denmark - 14 – 18 March 2016

Boilers and Pressure Vessels

- PD442 - BPV Code, Section VIII, Division 1: Design and Fabrication of Pressure Vessels (14–16 March) **ASME Code Course**
- PD616 – API 579 /ASME FFS-1 Fitness-for-Service Evaluation (14–17 March)
- PD441 – Inspections, Repairs and Alterations of Pressure Equipment (17–18 March) **ASME Code Course**
- PD146 – Flow Induced Vibration with Applications to Failure Analysis (14–16 March)

Fluids and Heat Transfer

- PD679 – Selection of Pumps and Valves for Optimum System Performance (16–17 March)

Nuclear

- PD389 - Nondestructive Examination - Applying ASME Code Requirements (Section V) (14–16 March)

Piping and Pipelines

- PD621 – Grade 91 and Other Creep Strength Enhanced Ferritic Steels (14–16 March)
- PD643 – B31.3 Process Piping Code (14–17 March) **ASME Code Course**

London, United Kingdom - 9 – 13 May 2016

Fluids and Heat Transfer

- PD673 - Design and Selection of Heat Exchangers (9–10 May)

Nuclear

- PD684 - BPV Code, Section III, Division 1: Rules for Construction of Nuclear Facility Components (9–13 May)**ASME Code Course**
- PD615 - BPV Code, Section III, Division 1: Class 1, 2, & 3 Piping Design (9–11 May)**ASME Code Course**
- PD672 - BPV Code, Section XI, Division 1: Inservice Inspection 10-year Program and 10-year Program Updates for Nuclear Power Plant Components (9–12 May)**ASME Code Course**
- PD633 - Overview of Codes & Standards for Nuclear Power Plants (11–13 May)**ASME Code Course**

Piping and Pipelines

- PD643 – B31.3 Process Piping Code (14–17 March) **ASME Code Course**

Welding

- PD645 – BPV Code, Section IX: Welding, Brazing, & Fusing Qualifications (9–11 March) **ASME Code Course**

ASME MasterClass Series in Europe

In addition to our public training offer, ASME offers MasterClasses courses in Europe, premium learning programmes covering advanced topics aimed at experienced engineering professionals. Led by renowned industry experts, MasterClasses emphasise learning through discussion of real world case studies and practical applications.

Copenhagen, Denmark - 14–18 March 2016

- Design by Analysis Requirements in ASME Boiler and Pressure Vessel Code Section VIII, Division 2 (MC121), 14–15 March
- Techniques and Methods used in API 579-1/ASME FFS-1 for Advanced Fitness-For-Service (FFS) Assessments (MC113), 16 March
- Bases and Application of Heat Exchanger Mechanical Design Rules in Section VIII of the ASME Boiler and Pressure Vessel Code (MC104), 17–18 March
- **NEW COURSE Not to miss!** Using ASME Codes to meet the EU Pressure Equipment Directive (PED) (MC135), 17–18 March

ASME In-company Training & Development

Train your staff at your choice of location, on your preferred dates, with a corporate programme tailored to your specific company requirements.

All ASME Continuing Education training courses can be arranged exclusively for your staff and customised to your company's needs. Courses will be delivered by uniquely qualified instructors selected to match your needs and organisational style and approach – most of them are involved in the ASME Code committees who create and update ASME standards.

Save time and money by hosting a course at your company building or at another venue of your choice. Encourage ongoing learning with Continuing Education Units and a complimentary one-year ASME membership.

The ASME In-Company Training service offers you:

- Training courses tailored specifically for your organisation, addressing your specific issues and challenges
- Courses that accommodate your schedule and are held at your facility
- Convenient and cost-effective educational programmes- Opportunities to train your staff in full confidence – customisation, results, privacy, quality, value

For more information on in-company training programmes and to discuss your needs in detail, please contact: Murat Dogru, Community and Corporate Relations Manager Email: DogruM@asme.org • Tel: +32 2 743 4427

Back to top

ASME STANDARDS & CERTIFICATIONS

Next Releases

The American Society of Mechanical Engineers (ASME) develops standards with safety in mind. From cranes, hoists and man lifts, nuclear and non-nuclear pressure vessels, geometric dimensioning and tolerencing, elevators and escalators, fasteners, flow measurement, environmental control, piping, pumps, storage tanks, turbines and much more. ASME is the recognised leader in mechanical engineering safety standards around the world.

Using ASME standards helps you:

- Enable collaboration and knowledge across all engineering disciplines
- Assure interoperability of mechanical products and systems
- Certify product performance

We constantly strive to provide the most current and accurate information on the future release of standards available from ASME. We provide a monthly email to all interested parties listing any ASME standard that is getting ready for release with a 3 month window. Any organisation working with ASME standards has the opportunity to get monthly updates simply by emailing mahlerc@asme.org or by clicking on this link.

Conformity Assessment

ASME's Standards establish widely accepted guidelines and requirements. Conformity assessment ensures activities are compliant with the standard. Certification and accreditation programmes are necessary in areas where safety and reliability are critical. ASME's Conformity Assessment group also offers personnel certification programmes that provide industries with a means to benchmark professional competency in areas where mistakes can be extremely costly. With industries in over 113 different nations holding ASME certificates, ASME remains the leader in safety certification.

Beginning this spring, ASME's Conformity Assessment group is beginning a series of workshops in Asia, India and Europe. The workshops cover many of today's most important topics in the field of certification, including case studies, certification and accreditation programmes, topics from National Board, as well as 3 workshops, Welding and NDE, Boiler and Pressure Vessel Requirements (Material, Quality Control Programmes, Examination & Inspection) and Section III Nuclear Requirements (Material, Supplier Approval, Quality Assurance Systems).

As with all ASME meetings, the workshop is free and open to all interested parties. For additional information, please visit go.asme.org/cert360

Back to top

ASME PUBLICATIONS

Book Of the Month Digital Library

Introduction to Dynamics and Control in Mechanical Engineering Systems

Expected March 2016, this first volume in the new ASME Press – Wiley Co-published Book Series covers the dynamics and controls of engineering systems, with particular focus on mechanical engineering systems. Pre-orders accepted now.

This textbook:

- Presents and illustrates the process of translating systems in the physical world to mathematical models in the conceptual world during the derivations of equations of motion
- Includes problems and solutions
- Contains a separate chapter for operating principles of sensors or transducers and their equations of motion
- Covers graphical methods for control system analysis and design
- Presents modern control system analysis as a foundation for a second or graduate course in control engineering
- Includes applications of MATLAB for numerical solutions to various questions in system dynamics in order to verify exact solutions and enhance understanding as well as interpretation of solutions

Print book copies may be ordered through Wiley (Use discount code ASM3 to receive ASME

member discount.)

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Back to top

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