AETC 2020 Meeting Program

Sunday, February 9
2:00PM-6:00PM  Registration Open
Location: Regency Ballroom South

Monday, February 10
7:00AM-5:00PM  Registration Open
Location: Regency Ballroom South
7:00AM-12:00PM  Committee Meetings
8:00AM-11:00AM  Continuing Professional Development Sessions
COST: $50.00

  CPD1 – Industrial Bearing Primer for Agricultural Applications
  Instructor: Tom Triola, Timken Company, Principal Application Engineer, Canton, Ohio
  Location: Park Suite
  This interactive technical session will review the different industrial bearing types – ball, cylindrical, spherical
  and tapered and their basic design features. Following that will be information on the various housed units (pillow
  blocks) available that incorporate industrial bearings, bearing lubrication basics, seal considerations, bearing fits and
  mounting practices, and a sample bearing model for fatigue life analysis review. A discussion of bearing damage
  analysis modes will wrap up the 3 hour session.

  CPD2 – Concurrent Engineering and Design for Manufacturing and Assembly (DFMA®)
  Instructor: Chris Tsai, Boothroyd Dewhurst, Inc., Director, DFMA® Implementation Services,
  Wakefield, Rhode Island
  Location: Kentucky Suite
  Concurrent Engineering and Design for Manufacturing and Assembly (DFMA®) is a process (predominantly
  product development) that can significantly reduce costs, improve worker ergonomics and safety, and improve
  product quality and reliability. There are core principles that can be applied to any design effort to achieve these
  results. This session will introduce many of these core principles and how they have been utilized across multiple
  industries including the agricultural equipment industry. The presentation will blend the theories and philosophies of
  DFMA® with examples of practical applications and the results. In addition to case studies there will also be
  information regarding software that can bring data and objectivity to your DFMA® efforts.

  9:45AM-11:00AM  Student Focus Session
  Re-Engineering a Career
  Rusty Unterzuber, AETC Past Chair, Davenport, Iowa
  Location: Gulfstream-Hialeah
This session will provide students and young professionals with observations, insights, and ideas for their consideration as they define and establish themselves and their careers.

This presentation is a lighthearted look at what really happens over a career in spite of all the planning and best of intentions. It is sharing of professional and personal experiences and revelations after 50 years engaged in the agricultural and off-highway equipment industry. The lessons learned are applicable in any work environment and business area. That in itself is a lesson. A major revelation is that the technology or scientific knowledge you utilize eventually becomes secondary to how you organize and execute your work.

Topics will include:
• Lessons Learned & to Be Learned
• Relationships
• Mistakes or Just Poor Choices?
• Satisfaction vs Success
• Planning for Life

11:00AM-12:00PM Welcome Ceremony and Student Poster Session & Competition
Location: Regency Ballroom South
Undergraduate and graduate students will present their research or design projects in the form of a poster presentation during this session. Posters will be evaluated by industry and academic professionals to determine the winners. Through the financial support of the ASABE Initiative Fund, monetary award prizes will be distributed this year. Awards available are 1st Place: $250, 2nd Place: $100, 3rd Place: $50 for both graduate and undergraduate groups.

12:00PM-1:30PM Luncheon with Keynote Speaker
Challenges and Opportunities in Agricultural Hemp Production
Dr. Bob Pearce, Philip Morris Professor, Extension Tobacco Specialist, UK CAFE Hemp Program, College of Agriculture Food and Environment, University of Kentucky, Lexington
Location: Regency Ballroom North
Hemp has exploded onto the national agricultural scene following enactment of the 2018 Farm Bill. With the recent release of the USDA Interim Final Rule for hemp production, states are scrambling to put regulatory procedures in place. At least 47 states are expected to have a program to allow hemp production in 2020. Hemp has been promoted as a crop with tremendous potential to shore up lackluster farm profits and at the same time reduce environmental degradation. Proponents have claimed hemp thrives on marginal lands, needs little or no fertilizer, and is resistant to competition from weeds, insects and disease. Limited experience with hemp in Kentucky has shown these claims to be at best only partially true. Kentucky was one of the first states to conduct field research on hemp in the modern era, and has experienced many of the challenges that will be faced to make hemp a viable and valuable crop for U.S. farmers. Generally, there are three main product types and associated production systems which are being developed for hemp; 1) natural fiber, 2) grain and seed oil, and 3) floral production for extraction of essential oils or direct consumption. Each of these production systems have different challenges that will be discussed. One of the biggest challenges will be the development of locally adapted cultivars that consistently meet the federal definition of hemp with regards to THC concentrations. Additional challenges include improved seed quality and establishment practices, development of pest management practices, and post-harvest handling procedures. There are many opportunities and challenges for mechanization of hemp. The tough fibrous nature of the stems and stalks have proven to be a challenge for conventional forage and grain handling equipment. Mechanical solutions are also needed for efficient removal of the female flowers and buds from the stems and stalks for floral extract production. The industry is moving ahead quickly and systematic research and development are needed to support growers interested in this high-risk, potentially high-reward crop.

1:30PM-5:00PM Technical Sessions & Committee Meetings
1:30-3:30pm Tech Session #1 – Standards Update
Moderator: Scott Cedarquist
Location: Park Suite
This session will overview key standards development activities and regulations pertaining to agricultural equipment. A selection of timely topics will be included which cover priority North American and international activities.
1:35pm US Regulatory Issues Associated with Agricultural Equipment – Nick Tinkdall, Association of Equipment Manufacturers (AEM), Washington, DC
1:45pm Canadian Technical Issues Management – Karl Klotzbach, CNH Industrial, Racine, Wisconsin
1:55pm Update on Highly Autonomous Equipment Standardization – Todd Howatt, AGCO Corp, Jackson, Minnesota
2:05pm Higher Voltage Agricultural Equipment – Rick Weires, John Deere, Asbury, Iowa
2:20pm Hot Topics from the Outdoor Power Equipment Industry – Daniel Mustico, OPEI, Alexandria, Virginia
2:30pm Updates on the Latest ISO Combine Standards – Mark Dilts, CNH Industrial, New Holland, Pennsylvania
2:45pm Braking Standards Update – Bruce Hawkins, John Deere, Davenport, Iowa

3:45-5:15pm Tech Session #2 - Hydraulics 101 (part 1) – Fluid Fundamentals
Moderator: Shane Williams
Location: Park Suite

The lifeblood of all hydraulic systems and the most important component regardless of the functional intent of the system is the oil. The oil is what does the (dirty) work. Before diving deeper into the other physical components of hydraulic systems, it is necessary to first take some time to better understand the hydraulic oil itself and learn about what makes it unique and vital. Led by some of the leading experts in the hydraulic fluids industry, this session will focus on topics including hydraulic fluids commonly found in agricultural vehicles, industrial hydraulic fluids in the off-highway and agricultural sector, trends in the oil industry, controlling hydraulic oil contamination, and the basics of hydraulic filtration.

3:50pm Fundamentals Introduction – Tractor Hydraulic Fluids – Philippe Dussault, Lubricant Technical Advisor, Exxon Mobil, Longueuil, Quebec, Canada
4:05pm Industrial Hydraulic Fluids (Off Highway and Ag Sector) – James Hannon, Lubricant Technical Advisor, Exxon Mobil, Allentown, New Jersey
4:20pm Industry Trends in Hydraulic Fluid – Helen Kilfoyle, Equipment Builder Engineer, Exxon Mobil, Dewitt, Michigan
4:35pm Contamination Control – Mike Galloway, Equipment Builder Engineer, Exxon Mobil, Cary, North Carolina
4:50pm Introduction to Hydraulic Filtration – Mike Galloway, Equipment Builder Engineer, Exxon Mobil, Cary, North Carolina

3:45-5:15pm Tech Session #3 – Professional Development: Exploring New Dimensions in Your Career
Moderator: Karl Klotzbach
Location: Kentucky Suite

This session is the second in the series of professional development sessions for students as well as early and mid-career professionals. These topics may be a smaller portion of a formal education program but, more generally, are not. Mastering these topics will increase career satisfaction and long-term success.

The focus for this session will be “The Keys to Successful Projects”.

Most of the work you do as an engineer or scientist should be considered as a project regardless of the magnitude. The process to define the work to be done, gain approval to do the work, complete it, and evaluate the results should always be applied. Organization of the work is as important as organization of the technical content.

The speakers will provide insights based on experience that will help you move your ideas and work ahead to successful completion regardless of scale.

3:45pm Motivations to Understand and Utilize Project Management – Karl Klotzbach, CNH Industrial, Racine, Wisconsin
4:00pm Project Life Cycle – Karl Klotzbach, CNH Industrial, Racine, Wisconsin
4:20pm Approval Process – Rusty Unterzuber, AETC Past Chair, Davenport, Iowa
4:30pm Project Accounting, Estimating, & Budgeting (Tips & Tricks) – Rusty Unterzuber, AETC Past Chair, Davenport, Iowa
4:45pm The Myths & Realities of Project Management – Rusty Unterzuber, AETC Past Chair, Davenport, Iowa
5:05pm Q&A – Karl Klotzbach, CNH Industrial, Racine, Wisconsin
5:30PM-7:15PM  Distinguished Lecture – The Nebraska Tractor Test Laboratory: 100 Years of Service  
Moderator: Rusty Unterzuber  
Roger M. Hoy, PhD., Professor and Director – Nebraska Tractor Test Laboratory,  
Department of Biological Systems Engineering, University of Nebraska-Lincoln;  
Michael F. Kocher, PhD., P.E., Associate Professor and Chair – Nebraska Board of Tractor  
Test Engineers, Department of Biological Systems Engineering, University of Nebraska-  
Lincoln  
Location: Park Suite  
The history of the Nebraska Tractor Test Laboratory is presented describing changes for tractor technology  
and globalization. The current tractor test, and interpretation of test reports are presented. Recent research  
supporting testing procedures is discussed including the method to verify tractor power when a full Power Take-Off is  
not present, and development of a dynamic ROPS test for large tractors. Future testing challenges are described  
such as those presented by electric tractors, electric power delivery to implements and multi-mode testing.

7:15PM-9:00PM  Student / Industry Event  
Location: The Sports & Social Club, 427 S. 4th Street  
This event is a great opportunity for students and professionals to become acquainted and share  
experiences. The casual atmosphere, food, and bowling all make for a relaxing and enjoyable meeting.  
Preregistration required: $30 Industry/$15 Student

Tuesday, February 11
7:00AM-5:00PM  Registration Open  
Location: Regency Ballroom South

7:00AM-12:00PM  Committee Meetings

8:00AM-12:00PM  Technical Sessions  
8:00-9:45am  Tech Session #4 – Big Data and Data Management in Digital Agriculture  
Moderator: Ganesh Bora  
Location: Park Suite  
Information and data are key in precision, smart or digital agriculture. Sensors and controllers, telematics,  
and drones are major source of spatial and temporal data in digital agriculture. The volume of data in digital  
agriculture brings challenges of data transfer, telematics, software availability, storage, security of storing in clouds,  
end uses besides the legal issues of Big Data in Precision Agriculture. Technology and workforce development will be  
key to provide solution.

8:05am  Digital Agriculture is only as Good as the Data Underneath: Interoperability and Other  
Concerns – R. Andres Ferreyra, Syngenta Crop Protection, LLC, Murray, Kentucky  
8:30am  Updating the Machinery Management Standard: Needs and Benefits – Ed Brokesh, Kansas  
State University, Manhattan, Kansas  
8:55am  Connecting Machine Data to Farm Management Systems: An Overview of Data  
Management Technologies from the Implement OEM Perspective – Eric Smith, JCA  
Electronics, Winnipeg, Manitoba, Canada  
9:20am  Big Data Applications Present and Potential – Tyler B. Mark, University of Kentucky

8:00-9:45am  Tech Session #5 – Harvest Logistics in the 21st Century  
Moderator: Mark Dilts  
Panelists: Kerry Knuth (Grain Farmer), Mead, Nebraska; Jason Veikle (Grain Farmer), Cut  
Knife, Saskatchewan, Canada; Dan Byers (Custom Forage Harvester), Berwick, Illinois; Harry  
Wallace (Custom Forage Harvester), Galva, Illinois; Ross Woodruff (Grain Farmer), Sabina,  
Ohio; Jim Schmidt (Grain Farmer), Manhattan, Kansas  
Location: Kentucky Suite  
This session will feature a variety of Farmers and Custom Operators talking about logistics in their operations.  
Each presenter will talk briefly about their operation and the best practices they use. Following will be a panel  
discussion about operational best practices and needed improvements during the Harvest season.
Tech Session #6 – A Pictogram is Worth...
Moderator: Rusty Unterzuber
Karl Klotzbach, CNH Industrial, Racine, Wisconsin; Valerie Lynch, AEM, Milwaukee, Wisconsin
Location: Park Suite

Pictograms provide a more concise way to communicate a concept in the place of words. Their use in safety signs has grown in popularity and usage for several decades as a means for communicating important information to machinery operators, especially in calling attention to risks of harm for hazardous situations that cannot be eliminated by alternative design solutions or protective measures such as guarding or shielding.

This technical session will explore some of the history in the use of pictograms in the creation of safety messages, an international standard that provides principles for conveying safety information through graphic communication and other resources available for use and better understanding of important information communicated through pictograms.

Tech Session #7 Hydraulics 101 (part 2) – Fluid Conveyance and Control in Hydraulic Systems
Moderator: Shane Williams
Location: Kentucky Suite

Selecting the proper components to convey and direct hydraulic oil is vital to achieve the appropriate functionality and reliability that the system requires. In order for the oil to do its work, the right amount needs to be in the right place at the right time. This session will focus on the basics of hydraulic tubing and hydraulic hose construction, including a discussion on the various end conditions that are available for these assemblies. A discussion of the different types and operating principles of pressure control, directional control, and flow control valves will also take place, along with some examples of applications when certain valves are a more appropriate choice compared to other possibilities. Other session highlights will include a discussion on concept hydraulic pump circuitry in order to improve performance and efficiency in row-crop tractors, as well as a brief overview of the MS-23/4/4 (Tractor and Implement Hydraulics) committee of ASABE and its involvement in the world of mobile hydraulics.

10:50am Welded Steel Tube Hardness Measurement and the Relationship to Mechanical Properties for Agriculture Related Applications – Wynn H. Kearns, Indiana Tube Corporation, Evansville, Indiana
11:20am Improving Row Crop Tractor Performance by Intelligent Pump Summation – Wyatt Hall, Danfoss Power Solutions, Ames, Iowa
11:35am ASABE and Its Effect on Hydraulic Power on Agricultural Equipment – Michael Stelzle, CLAAS Omaha Inc., Omaha, Nebraska

AE50 Awards Recognition Luncheon
Location: Regency Ballroom North

During the luncheon, we’ll recognize AE50 winners for their innovations, advancements and new technologies. Winners are also highlighted in a special issue of ASABE’s Resource magazine. Top ranking AE50 innovations become eligible for the prestigious Davidson Prize, which will be presented with AEM at the Commodity Classic.

Each year the AE50 awards recognize companies offering the best engineered innovations for agricultural, food, biological and related systems. The AE50 winners featured in this session were new to the marketplace in 2019, and all have the potential for significant impact in their area of industry. This is an excellent opportunity to learn more
about the new features incorporated into these products and share a portion of their journey to the marketplace. The showcases are open to all registered attendees and will feature presentations on a sampling of those products receiving 2020 AE50 awards.

1:30-3:15pm  AE50 Showcase I  
Moderator: Austin Roepke  
Location: Park Suite  
1:30pm  Plant Stand Analyzer – Lie Tang, FieldRobo LLC, Ames, Iowa  
1:55pm  Sinclair Ecolabel® and Large Label V6 – Elizabeth Correia; Jeremy Isch, Sinclair Systems International LLC, Fresno, California  
2:20pm  LS475 Liquid System – Joshua Engelbrecht, John Deere Des Moines Works, Moline, Illinois  
2:45pm  Case IH AFS Connect® Magnum™ Tractor – Terry Sizemore, CNH Industrial, Racine, Wisconsin  

3:30-5:15pm  AE50 Showcase II  
Moderator: Brian Huenink  
Location: Park Suite  
3:30pm  Optidisc® Elite Cutterbar and OptiSense™ Belt Stall Indicator – Damion Babler, Kuhn North America, Brodhead, Wisconsin  
3:55pm  Ground Speed Management II – Todd DeBock, New Holland Agriculture, New Holland, Pennsylvania  
4:20pm  Tractor Implement Management (TIM) – Norbert Schlingmann, Agricultural Industry Electronics Foundation (AEF) e.V., Frankfurt, Hesse, Germany  
4:45pm  Intelligent Spray Control System – Gary VandeBark, Smart Guided Systems LLC, Indianapolis, Indiana  

1:30PM-8:00PM  Committee Meetings  

**Wednesday, February 12**

7:00AM-10:00AM  Continuing Professional Development Session  
COST:  $50  
CPD3 – Cost, Weight and Performance Advantages of Converting Weldments to Castings  
Instructor: Steve Metz, Applied Process, Inc., Oshkosh, Wisconsin  
Location: Gulfstream-Hialeah  

Are you searching for weight savings opportunities? Are you struggling with consistency in your fabrications? Perhaps a casting conversion is right for you. Join us for an educational session that will define what components are the best targets for casting conversion, provide insight to the most important steps in the design process, and explain the added performance features that can be achieved with castings. Our presenters will share success stories and will answer specific questions you may have about the casting conversion process.

7:00AM-8:00PM  Committee Meetings