

TUESDAY, APRIL 6th:

6.0 Closed-Loop Electrohydraulic Control Part I: Intro to Motion Control

The session begins by defining motion control, then covers factors that identify a motion control solution. Next, the roles of the positional servo mechanism and command profiles will be explained, followed by discussions of hydromechanical resonant frequency, system bandwidth, and advantages of motion control technology.

Speaker: Jack Johnson, P.E., I.D.A.S. ENGINEERING

Sponsor: Hydraulics & Pneumatics Magazine

6.1 Introduction to Hydraulics (Part I of a series.)

This session provides a basis for a comprehensive understanding of hydraulic and pneumatic (fluid power) systems. It compares fluid power to other forms of power transmission and discusses the advantages and disadvantages of each. It also explains the basic parameters (pressure, flow, geometry, force, torque, efficiency, et.) for working with fluid power components and systems. Attendees will then learn of the basic components that make up a fluid power system, the standard graphic symbols of each, and how to create a basic system from these building blocks.

Speaker: Tom Wanke, CFPE, Milwaukee School of Engineering

Sponsor: Hydraulics & Pneumatics Magazine

6.2 Ductile Iron As A Steel Alternative

When was the last time you took a close look at the materials that are being used in your hydraulic manifolds, pumps, cylinders and valves? Did you realize that by switching materials you could cut the cost of making those components in half? Learn how continuous cast ductile iron has all of the strength properties of carbon steel but it can be machined at speeds that are as much as 2-3 times faster. Increased machining speed equates to less time and money to produce the part. Attend this session and learn about the unique process of continuous casting gray and ductile iron bar stock, the grades and properties that are available, machining characteristics and how you can save money on your fluid power parts.

Speaker: TBD

Sponsor: DURA-BAR, INCORPORATED

6.10 Closed-Loop Electrohydraulic Control Part II: Proportional & Servovalves

A discussion that takes the mystery out of servo and proportional valves will open this session. Next, flow and pressure metering characteristics are described, followed by interpretation of catalog data, null characteristics, valve lap, disturbance current, the impact of valves on system performance, and servo and proportional electronic drivers.

Speaker: Jack Johnson, P.E., I.D.A.S. ENGINEERING INC.

Sponsor: Hydraulics & Pneumatics Magazine

6.11 Diagnostic Techniques for Hydraulic Systems

The focus of this presentation will be on specific diagnostic tools and the role they play in proper preventive maintenance, system troubleshooting and cost savings. The importance of knowing pressure, temperature, and other hydraulic functions while equipment is operating will be explained, along with viewing all system parameters at the same time and determining what is relevant.

Speaker: Tom Wanke, CFPE, Milwaukee School of Engineering

Sponsor: Hydraulics & Pneumatics Magazine

WEDNESDAY, APRIL 7th:

7.0 Closed-Loop Electrohydraulic Control Part III: Electrohydraulic System Design

The system operating envelope is the first topic covered in this session. Then controlling hydraulic parameters, sizing to meet load requirements and production cycle rates, optimal sizing of the hydraulic system, load cavitation prevention, power consumption, system efficiency, and system actuator pressures are addressed.

Speaker: Jack Johnson, P.E., I.D.A.S. ENGINEERING

Sponsor: Hydraulics & Pneumatics Magazine

7.1 Hydraulic System Troubleshooting Part I (Part I of a series.)

This session introduces a systematic approach to troubleshooting, which identifies malfunctions and finds their most likely causes instead of using ineffective trial-and-error component replacement techniques. Attendees will also learn the differences between electrical problems and fluid power problems and how to tell them apart.

Speaker: Tom Wanke, CFPE, Milwaukee School of Engineering

Sponsor: Webster Instruments

7.10 Closed-Loop Electrohydraulic Control Part IV: Closing the Loop on Electrohydraulic Motion Control

This session will open with discussions of closed-loop and valve bandwidth, then presents bandwidth/positioning error and bandwidth/following error formulas. Other topics include disturbance current and system errors, interpretation of test data scope traces, identifying hydromechanical and resonant frequencies, separation ratio criterion, PID control, plus pressure- and speed-control systems.

Speaker: Jack Johnson, P.E., I.D.A.S. ENGINEERING

Sponsor: Hydraulics & Pneumatics Magazine

7.11 Hydraulic System Troubleshooting Part II

This session picks up where Part I left off by introducing realistic system malfunctions and having attendees apply troubleshooting techniques they have learned to find the likely sources of the malfunctions. The session also introduces preventative maintenance techniques that can help prevent future malfunctions and extend component life. (Part II of a series.)

Speaker: Tom Wanke, CFPE, Milwaukee School of Engineering

Sponsor: Hydraulics & Pneumatics Magazine