



Survey Results

Instrumentation, Controls and Automation Interest Group Meeting

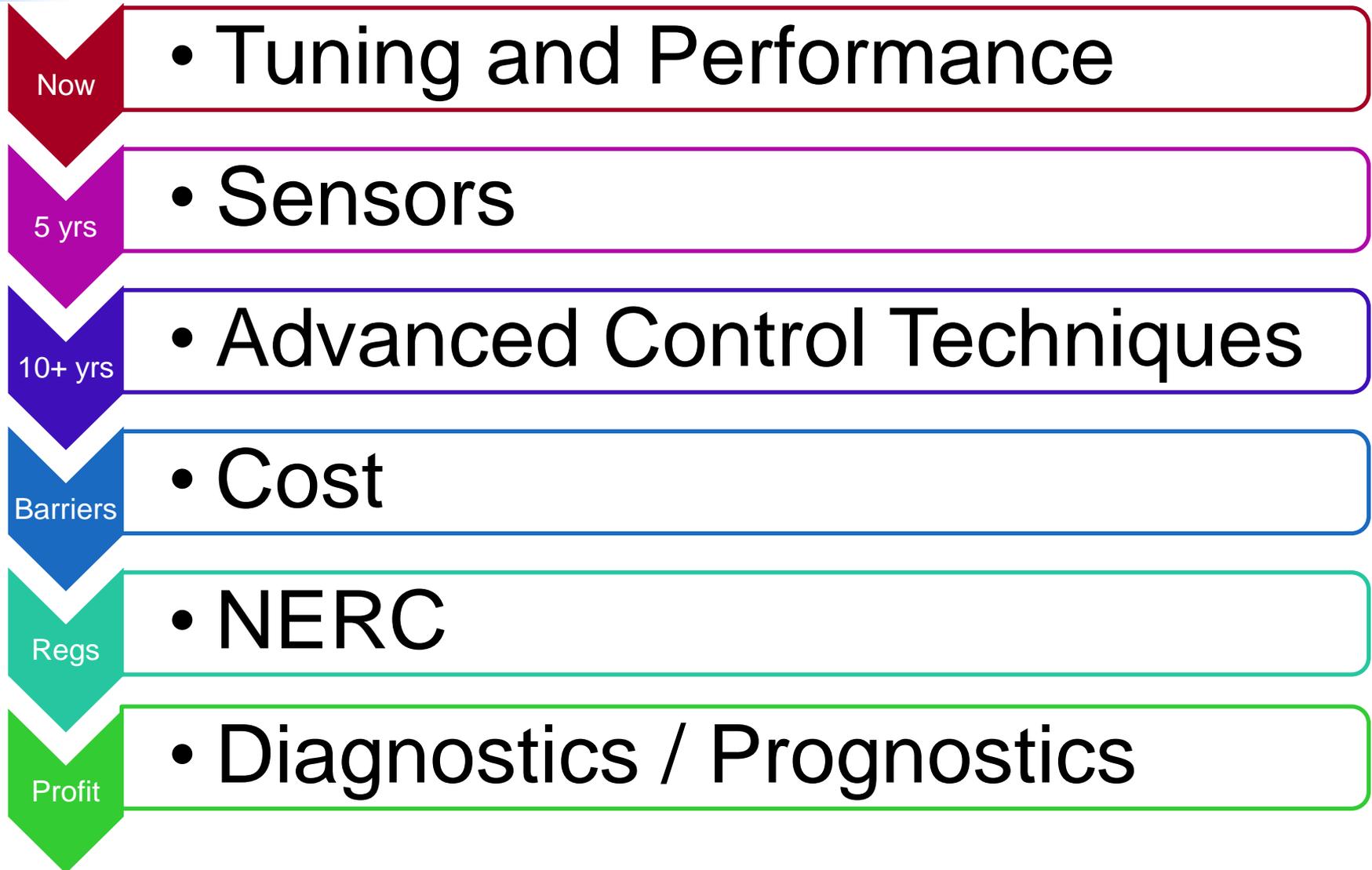


Neva Fox
EPRI

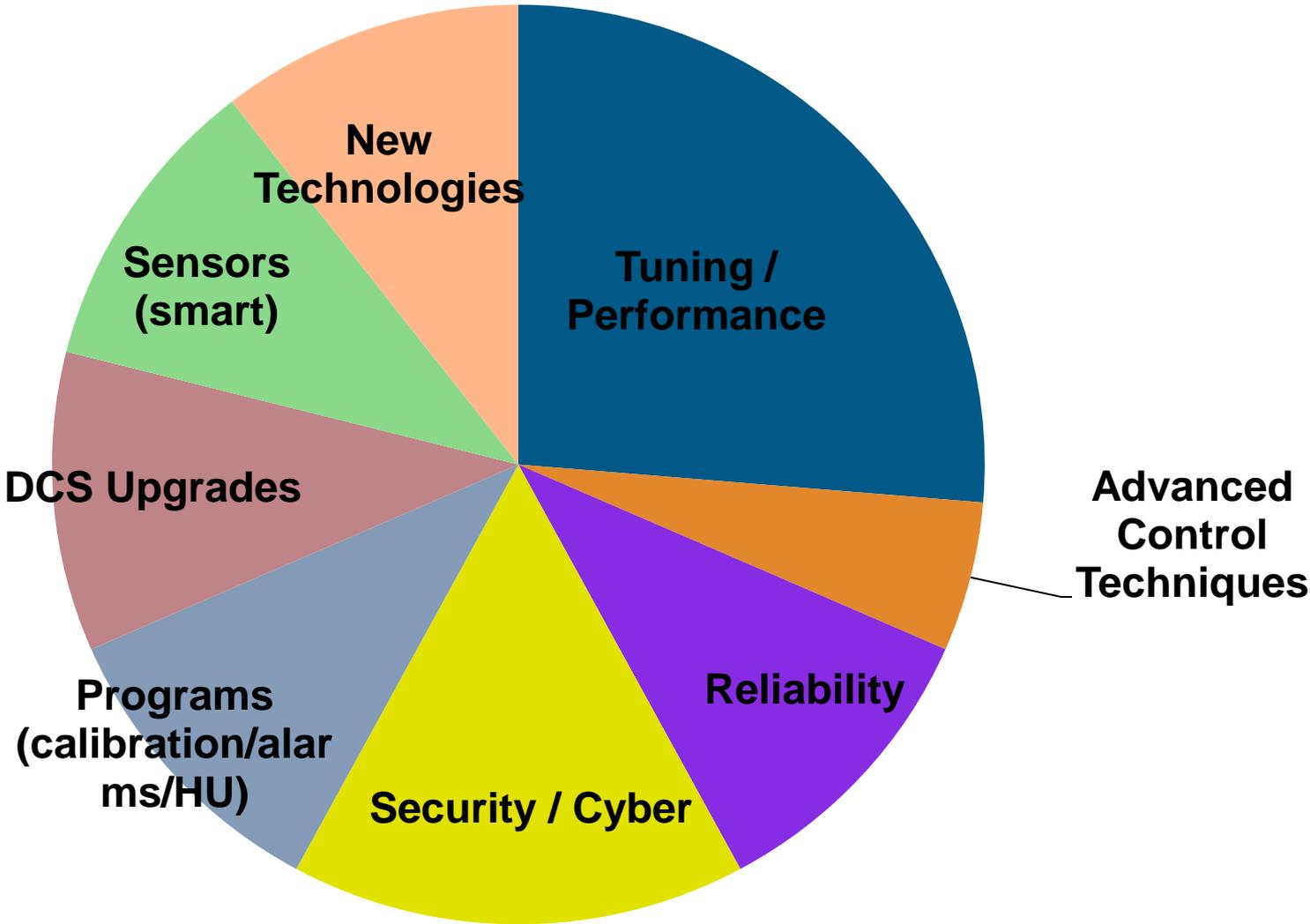
Susan Maley
US DOE NETL

June 6 – 7
Austin, TX

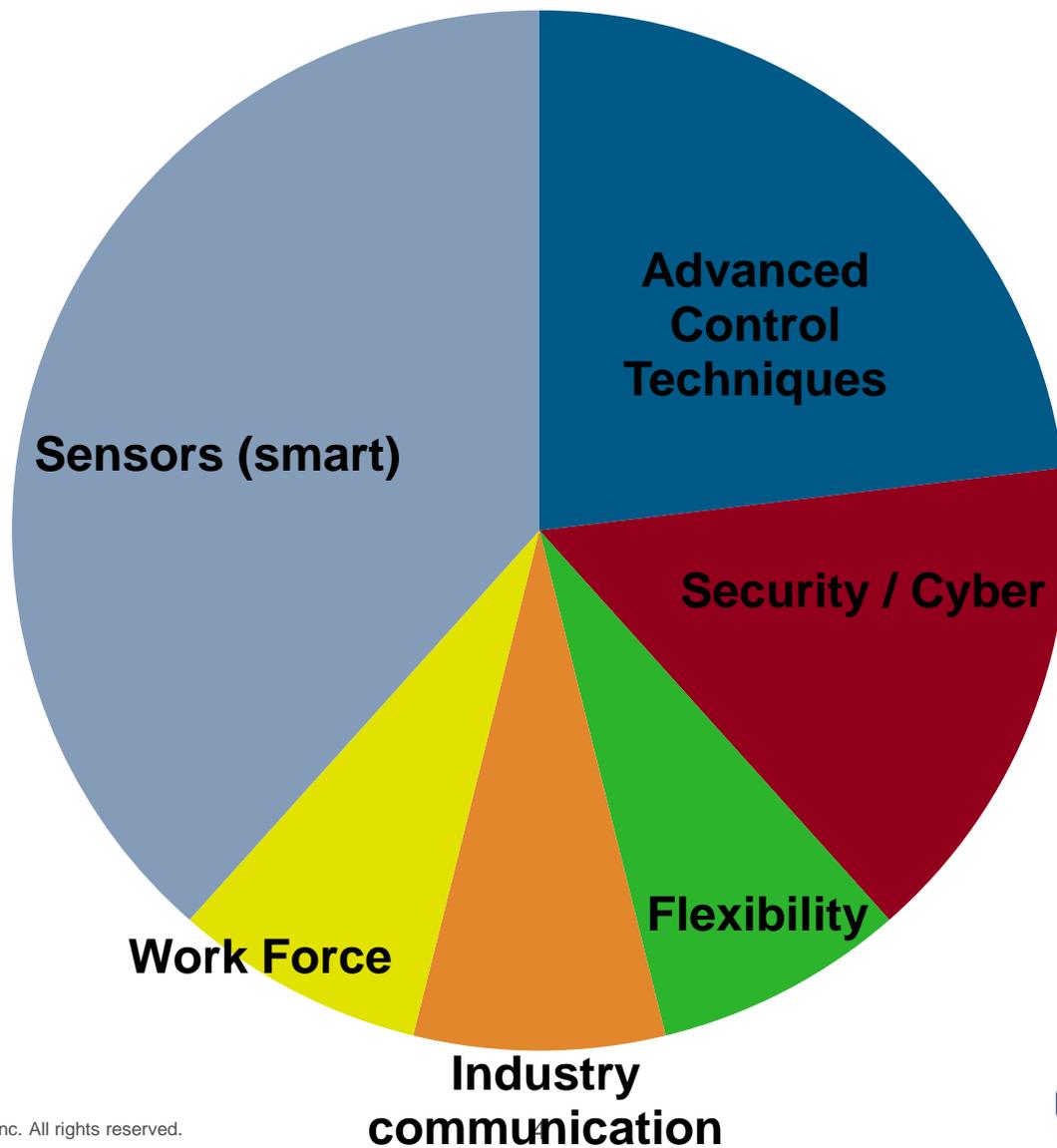
The Simple Answer is....



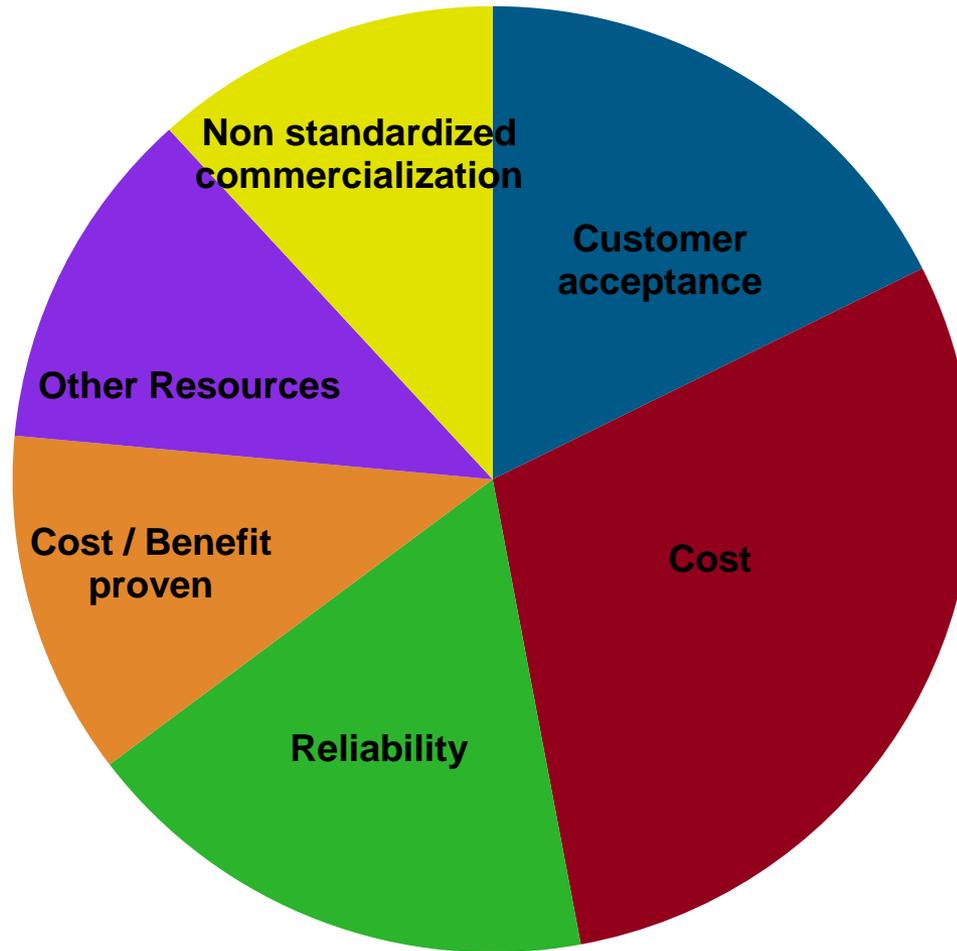
What do you see as your highest priority I&C issues for the next year?



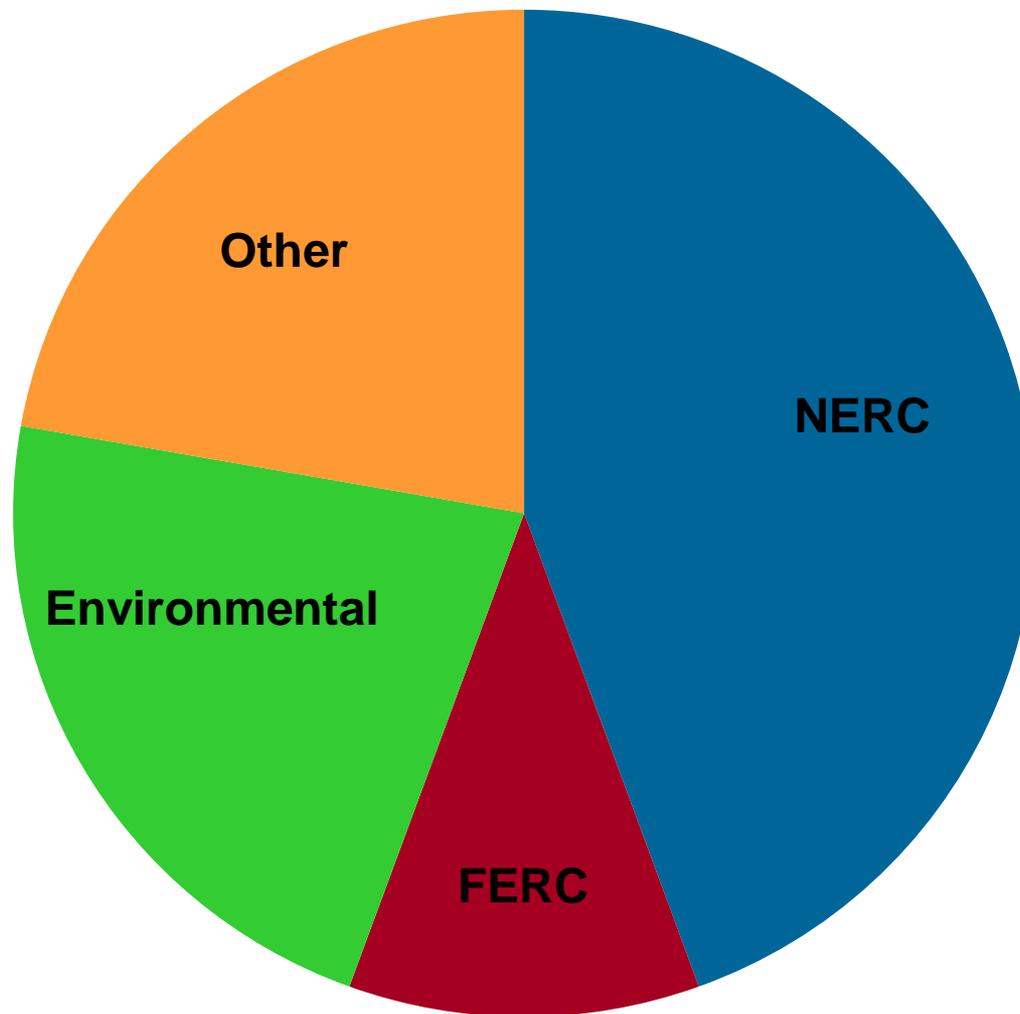
What do you see as your highest priority I&C issues for the next 5 years?



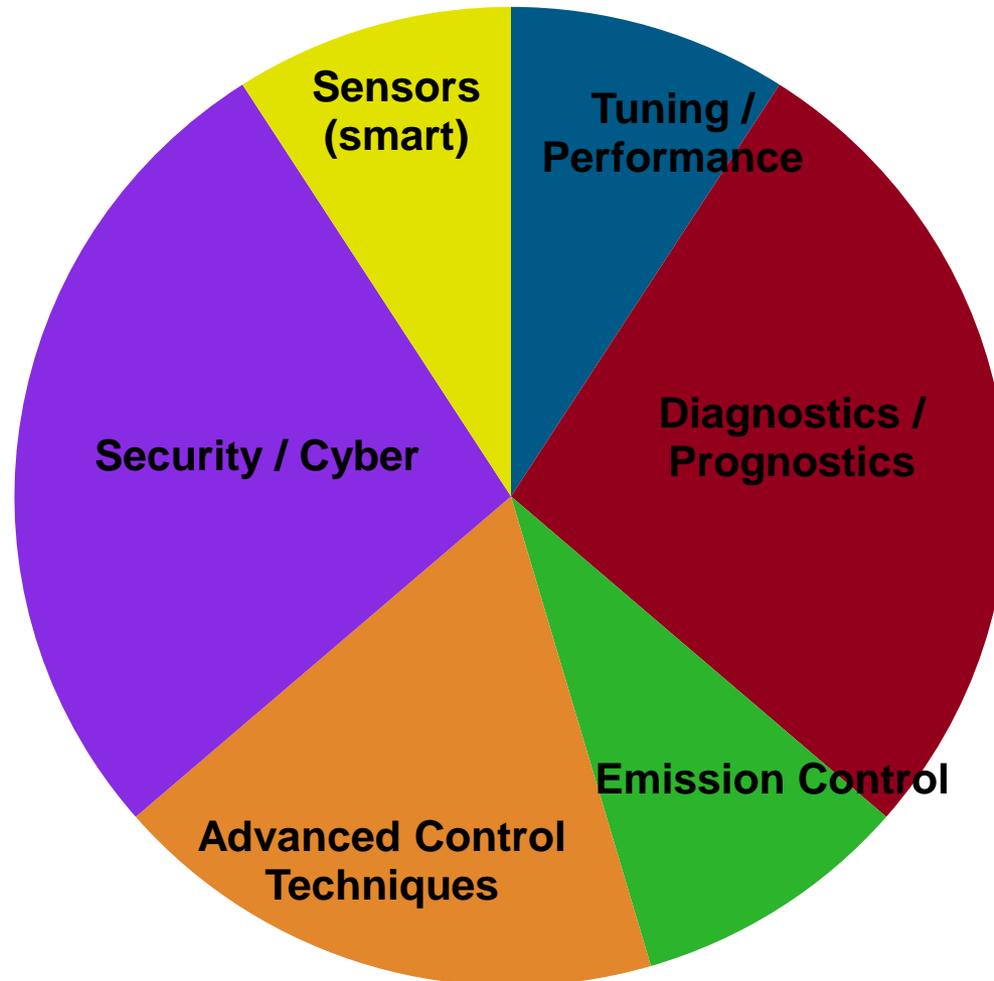
What obstacles prevent you from utilizing the latest I&C technologies to solve plant operating and maintenance problems?



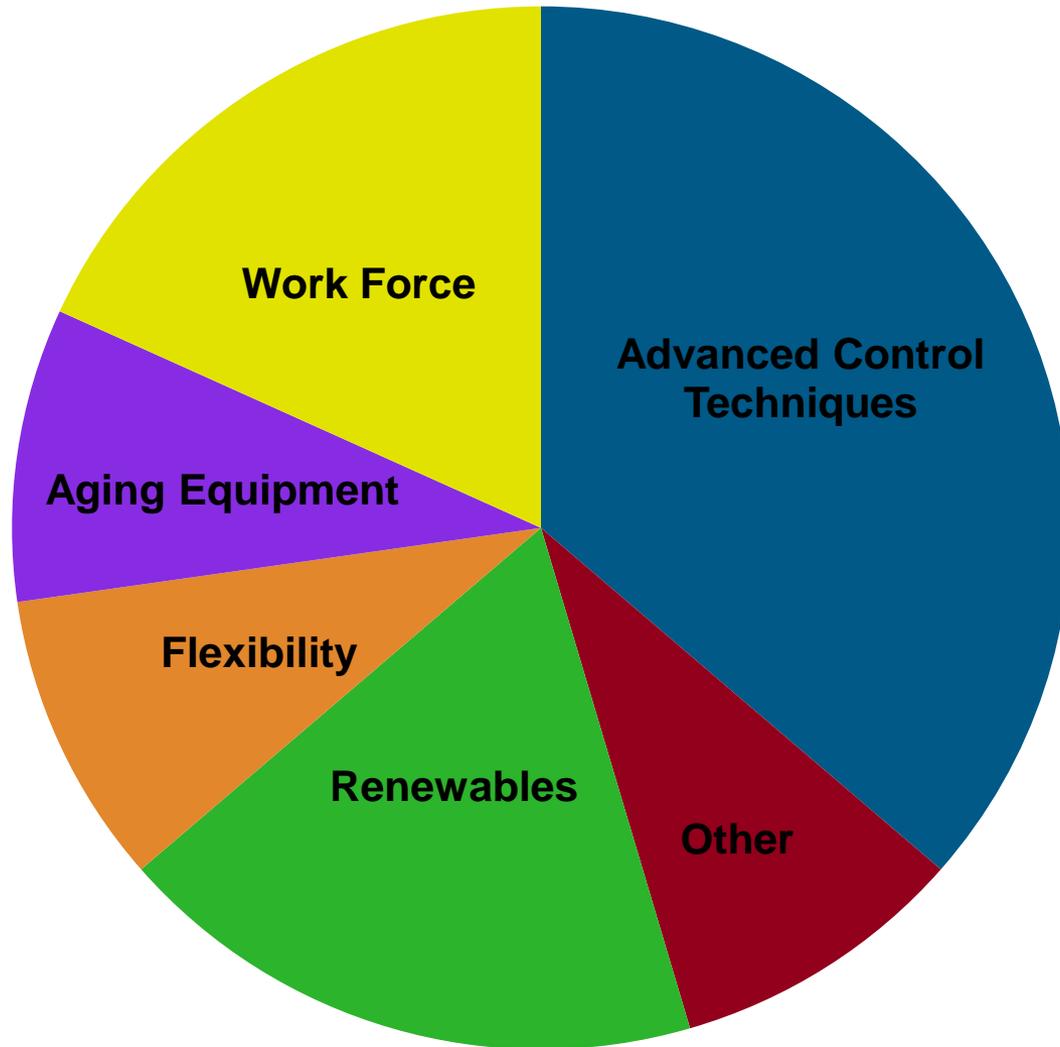
Which regulatory issues have the largest impact on your I&C organization?



Where do you see opportunities for I&C technology to save costs/maintenance and/or to create greater profitability



What do you see as your highest priority I&C issues for the next 10, 20 or 30 years?



What do you see as your highest priority I&C issues for the next year?

- PID tuning
- PID cluster robustification
- Reliable Sensor data
- Plant level control and optimization
- Reliability
- Security
- High Temperature Sensor Materials
- Cyber Security
- Maturing / Validating New Technology
- Implementation of a calibration program
- Optimization of existing control systems
- PID tuning
- Control system tuning
- Reliability
- Alarm Management
- Priority on Digital upgrades
- DCS upgrade
- Smart instrument implementation
- Cyber Security
- Vendor Product Familiarization
- Human Factors



What do you see as your highest priority I&C issues for the next 5 years?

- Model Predictive Control
- National Security, Safety
- More intelligence and flexibility
- Renewable Energy
- Interactive Communication between users, academia and vendors
- Work Force Augmentation
- Smart metering
- Adoption of device data from the onset of ICS
- Intelligent decentralized control
- Hybrid Power Generation controls
- Distributed Optical Sensors
- New Sensor Materials for Harsh Environments
- Cyber Security
- Model Based controls and optimization solutions
- Harsh environment sensors
- Robust adaptive control

What do you see as your highest priority I&C issues for the next 10, 20 or 30 years?

- PDE based control design
- PDE robust adaptive control
- Ability to use data from advanced sensors in advanced control strategies
- How to make advanced sensory and controls more distributed to go after large scale systems
- Chemical looping control & sensors
- I&C, Ops and IT should be seamlessly integrated
- Equipment longevity, fuel and energy management
- Hosted/managed services
- Adaption & Training
- Alternative Energies
- Renewable energy
- New Control Architecture for power plants
- Reliability incorporating advanced controls
- Flexibility and intelligence



What obstacles prevent you from utilizing the latest I&C technologies to solve plant operating and maintenance problems?

- Readiness of Technology
- Acceptance by customer
- Value added explicitly quantified
- Reliability
- Cost
- Amount of benefit added
- Materials
- Cost
- Customer Reliance on legacy technology
- Lack of vendor support
- Budget constraints
- I&C staff resources
- Cost
- Vendor non-standard commercialization
- Commercialization
- Availability of robust diagnostic technologies from sensor to unit to plant level to develop solution for not only normal operation but also abnormalities where standard models may be inadequate
- Resistance to change
- Cost
- Length of time required from conception to implementation
- Durability before commercial sales



Which regulatory issues have the largest impact on your I&C organization?

- Variation from site-to site & hence changing priorities
- NERC-CIP
- NRC I&C ISG-06 Licensing Process for digital upgrades
- NERC
- FERC
- TCEQ
- NERC-CIP
- NERC-CIP
- Environmental and fuel price regulation



Where do you see opportunities for I&C technology to save costs/maintenance and/or to create greater profitability

- Plant optimization: Reserve / peak power
- New emission control
- Advanced sensors
- Advanced prognostics to support predictive maintenance
- DOE
- Predictive Control
- Cyber security solutions
- MPC control implementation, energy optimization software
- Integration of operational technologies (ICS) with IT
- Automated Cyber Security apps
- Advanced diagnostics to increase operations efficiency & productivity
- More robust controls



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