Control Systems

Design, Performance, and Commissioning Issues

Lab Sessions

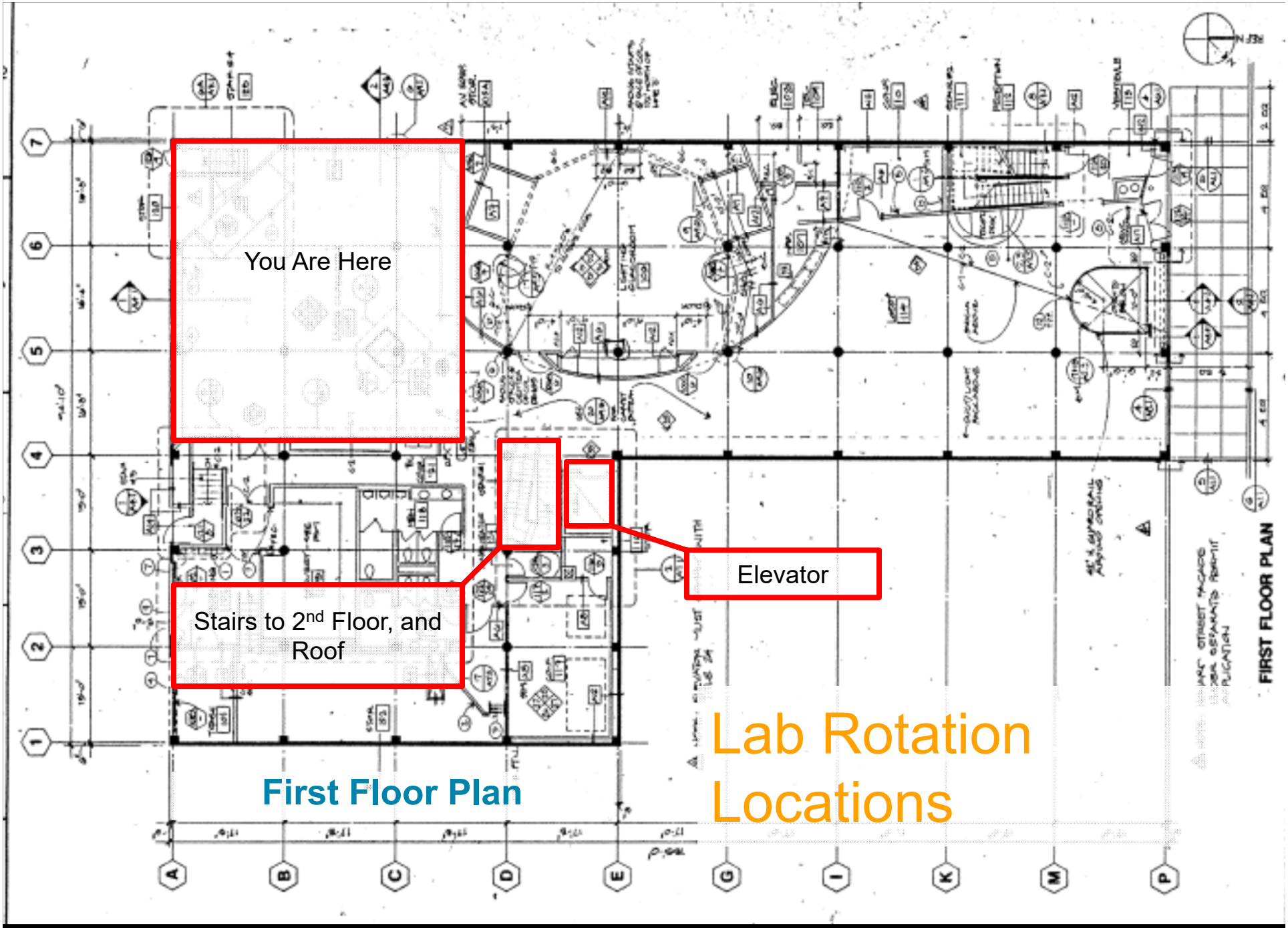
Instructor:

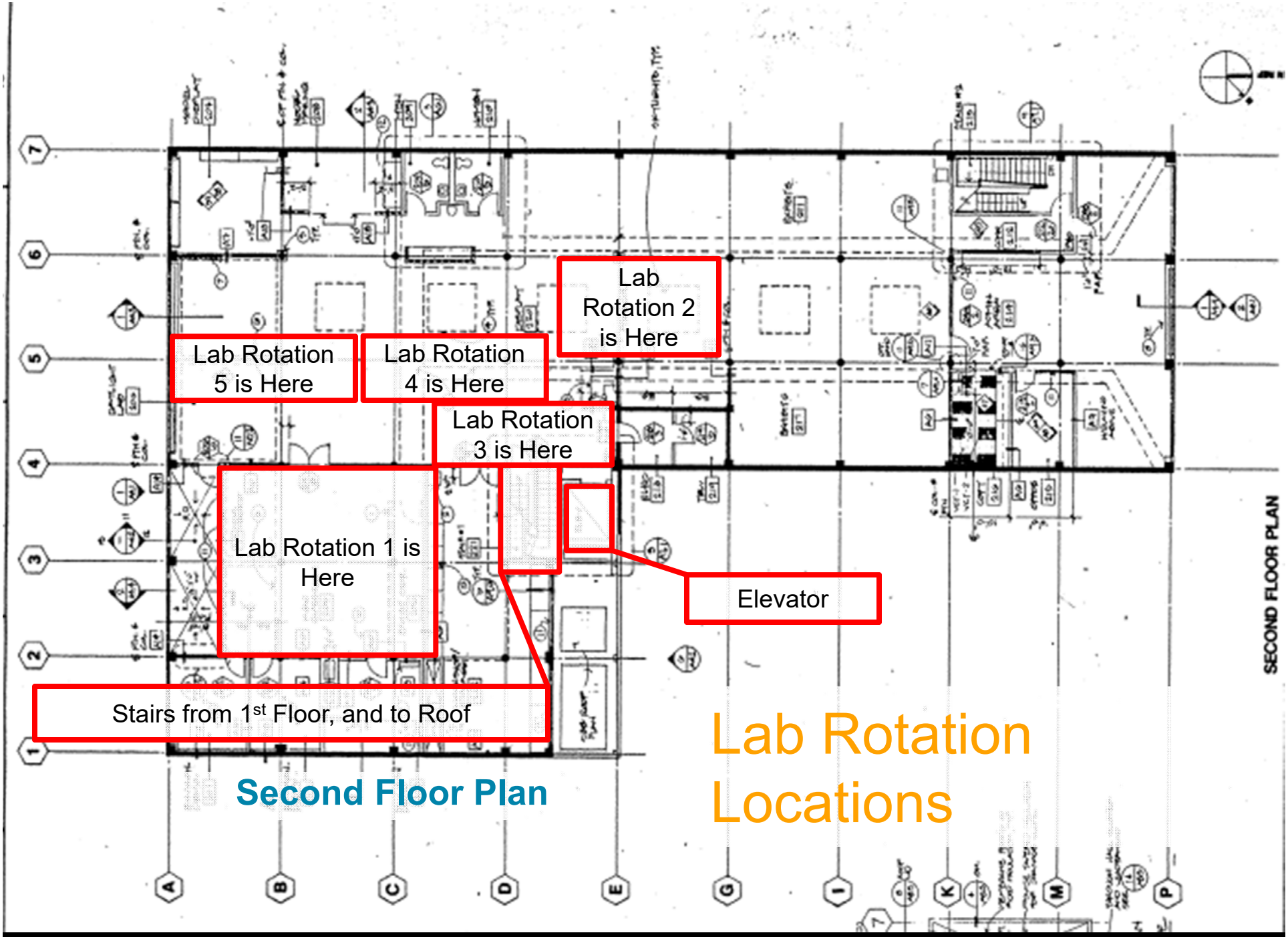
- David Sellers
- Senior Engineer
- Facility Dynamics Engineering

- October 13, 2015

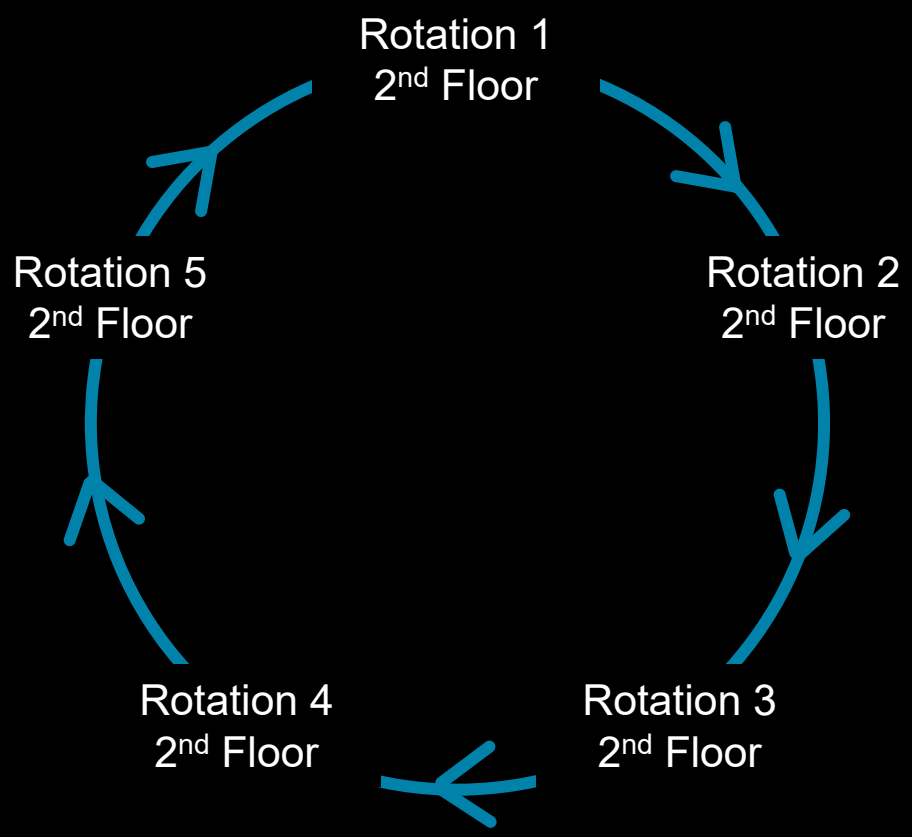
Lab Rotation Basics

- Exposure to real world field issues associated with control systems
- Six Stations
  - 30 minutes per station
  - 5 minutes to change stations
  - Follow-up/discussion at the end of the day
- Resources were distributed electronically ahead of the class


You Are Here
Stairs to 2nd Floor, and Roof
Elevator
First Floor Plan
Lab Rotation Locations
FIRST FLOOR PLAN


Lab Rotation 5 is Here
Lab Rotation 4 is Here
Lab Rotation 3 is Here
Lab Rotation 2 is Here
Lab Rotation 1 is Here
Elevator
Stairs from 1st Floor, and to Roof
Second Floor Plan
Lab Rotation Locations
SECOND FLOOR PLAN

Lab Rotation Sequence

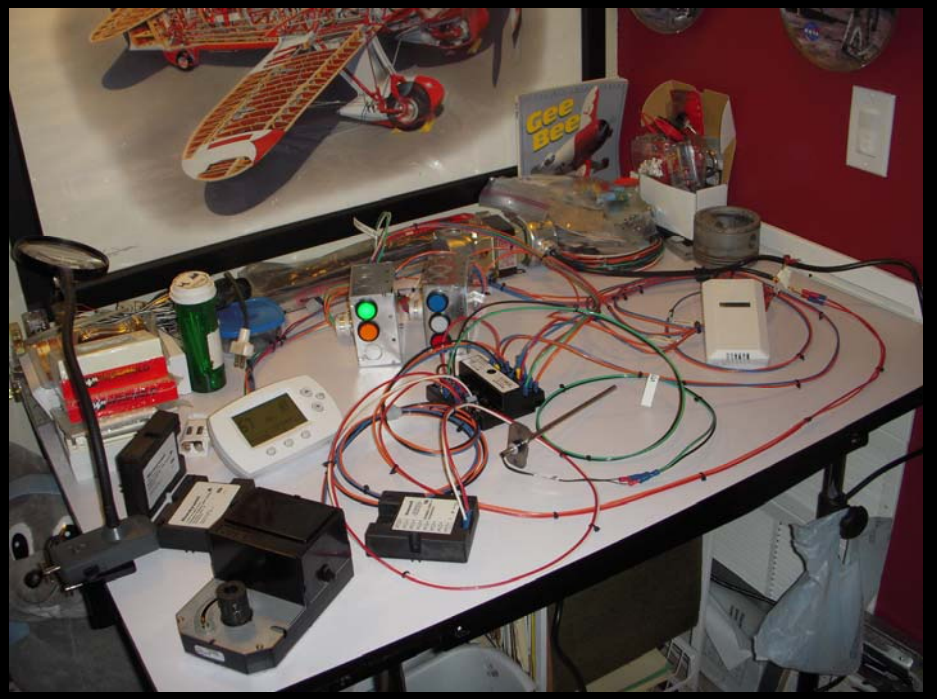


Rotation 1 – Packaged Economizer

David Sellers; Facility Dynamics Engineering

Work with a packaged economizer control system

- *Wire it up*
- *Make it work*
- *Discover its not so easy*



Rotation 2 – Pneumatic VAV Terminals

Ron Simens; Facility Dynamics Engineering

Use a working pneumatic VAV terminal to:

- Gain insight into pneumatic controls
- Gain insight into flow controllers on terminal units
- Gain insight into the impact of inlet conditions and damper position on accuracy

Rotation 3 - 4–20 ma Current Loops

Bill Pottinger, Janette Maurer; Pacific Energy Center

Work with 4-20 ma Current Loops to:

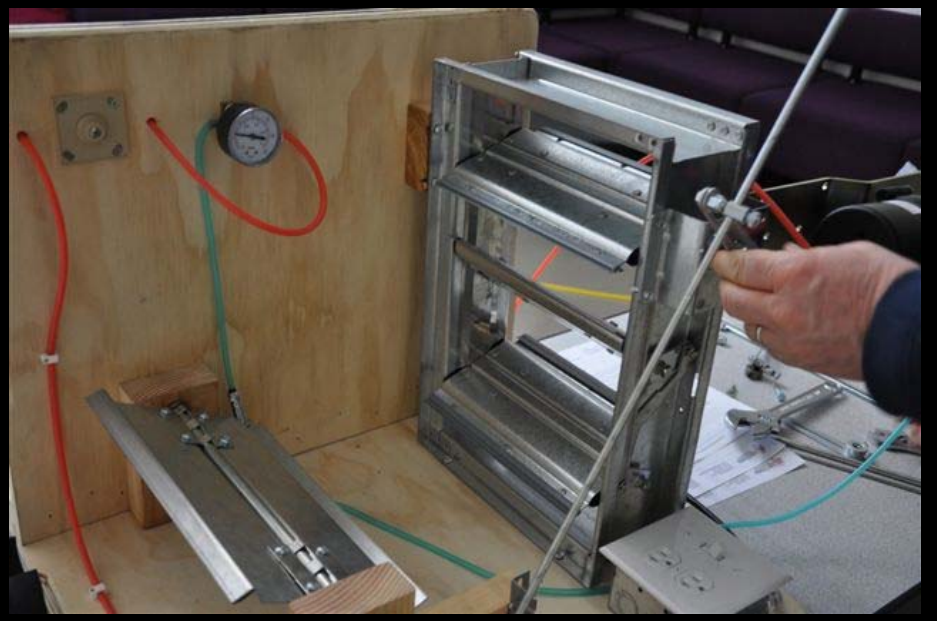
- Understand how current loops work
- Gain insight into sensor and transmitter technology
- Gain insight into the impact of wiring and mounting on sensor accuracy

Rotation 4 – Kinematics

Ryan Stroupe; Pacific Energy Center

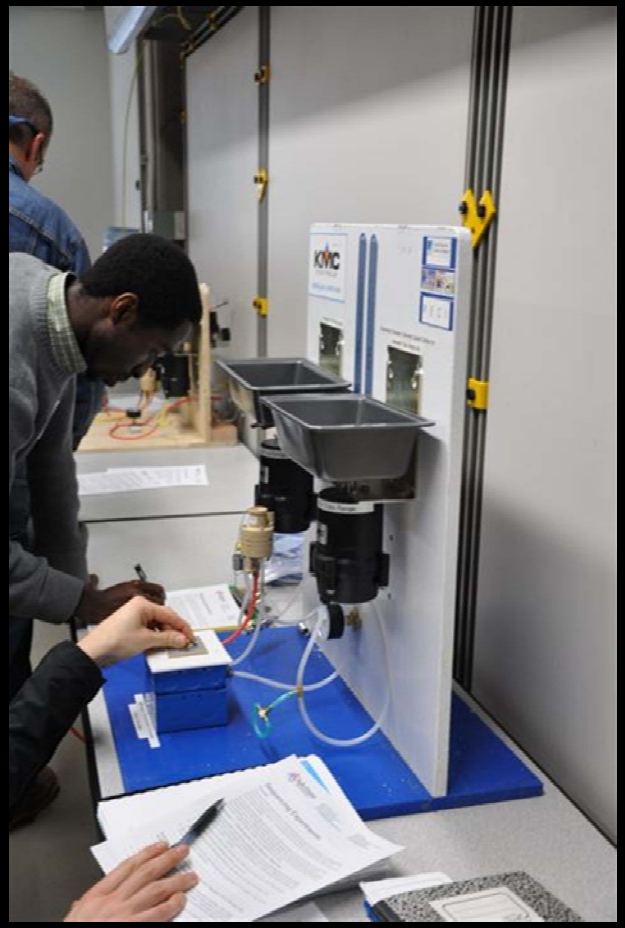
Work with linkage systems to:

- Gain insight into the mechanics of motion
- Gain insight into how field forces, conditions, and adjustments can impact control system performance



Rotation 5 – Actuator Sequencing

Sabastian St. John; St. John Consulting

Work with actuators and spring ranges to:

- Gain insight into a way control processes used to be sequenced in the olden days and how they still might be sequenced in a low budget, limited spec, DDC upgrade
- Gain insight into how field forces, conditions, and adjustments can impact control system performance