

# BVPS I/O System Replacement

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**FirstEnergy**<sup>®</sup>  
Generation Corp.

**Dan Tiberio, Beaver Valley  
Simulator Supervisor**



**CORYS**  
The Power of Simulation

**Stanley Chan, Chief  
Technology Officer**

# Topics

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- ❑ **What we upgraded & how we scheduled**
- ❑ **I/O upgrade**
  - Challenges
  - Unique interfaces
- ❑ **Future challenges**

# Upgraded Components

- ❑ DRPI interface replaced with Arduino module



# Upgraded Components

## ❑ Power Supplies



# BVPS I/O Upgrade



# BVPS I/O Upgrade



**Special thanks to Arkansas  
Nuclear One**

**Denver Walker  
Darrell Jones**

# And, yes, that is Dave O'Farrell doing actual WORK

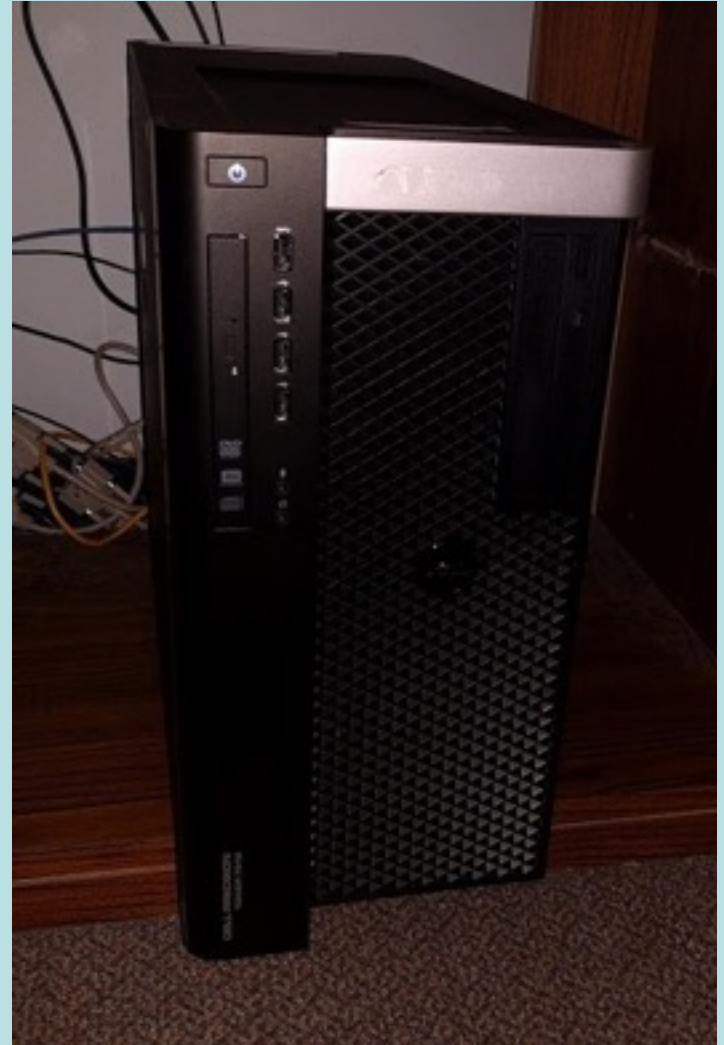
➤ We let him work on our stuff...



...but

# Upgraded Components

- ❑ **Simulation computer**
  - Dell Precision Tower 7910
  - Windows 7 64-bit OS
  - Previous Simulation computers were limited by the I/O interface





# Installation Challenges

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- ❑ **XtremeView & JADE graphics not functional**
  - Database modifications required
  
- ❑ **Gateways overloaded with too many Analog Outputs**
  - Lacked enough energy to provide all DOs
  - Split out those gateways
  
- ❑ **Stray voltages from I/O cards cycle recorder power**
  - Traced to dip switch settings on cards

# Installation Challenges



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# Installation Challenges

## ❑ Identified 2 legacy issues

### ➤ Floating grounds

- Original installation Westinghouse terminal strips
- Original I/O was not as precise
- Controller operation was biased
  - ground affected -5v to +5v zero point



# Installation Challenges

- SR Audio Count Rate Drawer
  - Not integrating and pulsing properly



- Pre-existing issue not identified before testing
- 2 integrated circuit chips were swapped inside

# Future Challenges

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- ❑ **Electrical and Thermohydraulic Model upgrades**
  
- ❑ **Network administration**
  - Ovation DCS incorporated in Unit 1
  - Future Arduino Modules
  - How to configure and monitor traffic

# Thanks!

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**Questions?**



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