

T&D Certificate Program & System Operator Training

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Transmission & Distribution Program

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Background

- ▶ Potential shortage of experienced power engineers
- ▶ Limited replacements due to past hiring practice, mergers, downsizing, and new graduate availability
- ▶ Few programs with power option – graduates have limited knowledge of power system
- ▶ New employees take 2 – 5 years to become fully productive - limited number mentors

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Initial Tasks

- ▶ Develop five industry focused engineering courses aimed at new graduates in utility related occupations
- ▶ Support northwest utilities by providing facilities for training System Operators in emergency restoration procedures

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Program Details

- ▶ Five course (graduate) certificate program
- ▶ Use industry experts to develop and teach courses in their area of expertise
- ▶ Industry experts provide mix of theory, industry standards and practice, and actual design examples
- ▶ Mentoring relationship with students
- ▶ Now have twelve courses for utility industry professionals – M.E. Degree Program

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Target Students – On-Line Courses

- ▶ Recent engineering graduates with little or no utility background (0 – 3 years experience)
- ▶ Engineers moving from other industries to utility field
- ▶ Senior engineers looking to update skills and expand their industry knowledge – but with limited interest in traditional advanced engineering degree

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Target Students (cont.)

- ▶ Intended for B.S. level graduates
- ▶ Material developed for regular 15-week course (45 contact hours)
- ▶ Courses offered on-line over eight weeks
- ▶ Students typically spend 2 - 3 hours on homework assignments for each “presentation” hour (12 to 18 hours/week)
- ▶ Assignments and on-line “discussion board” critical part of learning process

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Course Topics and Schedule

- Project Development and Construction Methods
- T-Line Design – Introduction and Advanced
- T-Line Design – Electrical Aspects
- Substation Design
- Distribution System Design
- Grid Operations
- Grid Automation
- Power System Analysis
- System Protection
- Engineering Leadership and Management
- Underground System Design (under development)*

Schedule

2009/2010 School Year				
Summer 09	Fall 09		Spring 10	
	Session I	Session II	Session I	Session II
	Electrical Dist. System Design	T-Line Design - Electrical Aspects	T-Line Design - Introduction	T-Line Design - Advanced
Power System Analysis	System Protection	Substation Design	Power System Analysis	System Protection
	Electrical Grid Operations	Grid Automation		Project Dev. & Construction Methods
2010/2011 School Year				
Summer 10	Fall 10		Spring 11	
	Session I	Session II	Session I	Session II
	Electrical Dist. System Design	T-Line Design - Electrical Aspects	T-Line Design - Introduction	T-Line Design - Advanced
Engineering Leadership	Project Dev. & Construction Methods	Substation Design	Power System Analysis	System Protection
Grid Automation	Electrical Grid Operations	T-Line Design - Underground	Grid Automation	Engineering Leadership

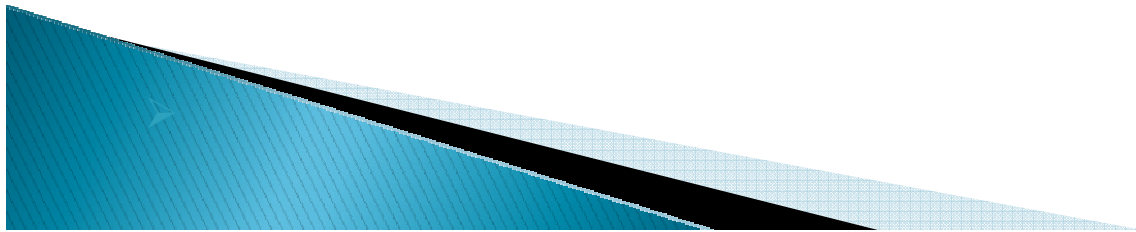
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Operator Training - Grid Modernization, Security, and Reliability



System Operator, Reliability Coordinator, Balancing Authority, Generation Operator, etc.

Many utilities in

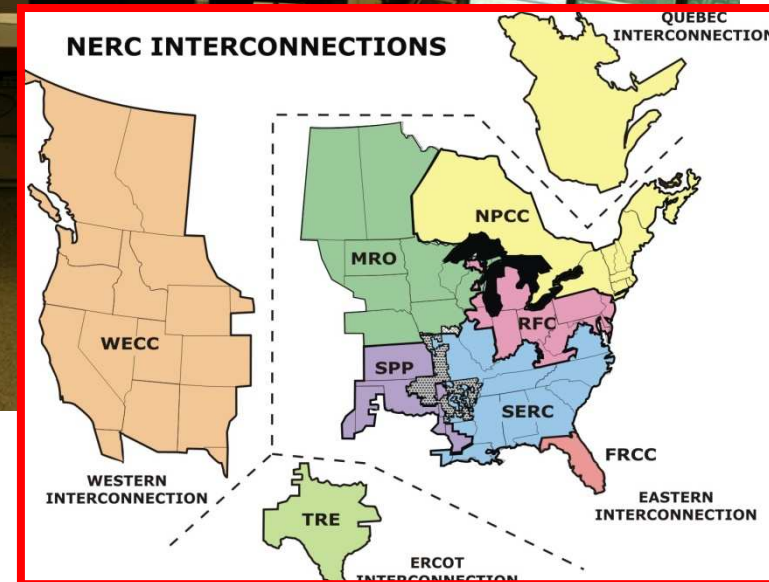
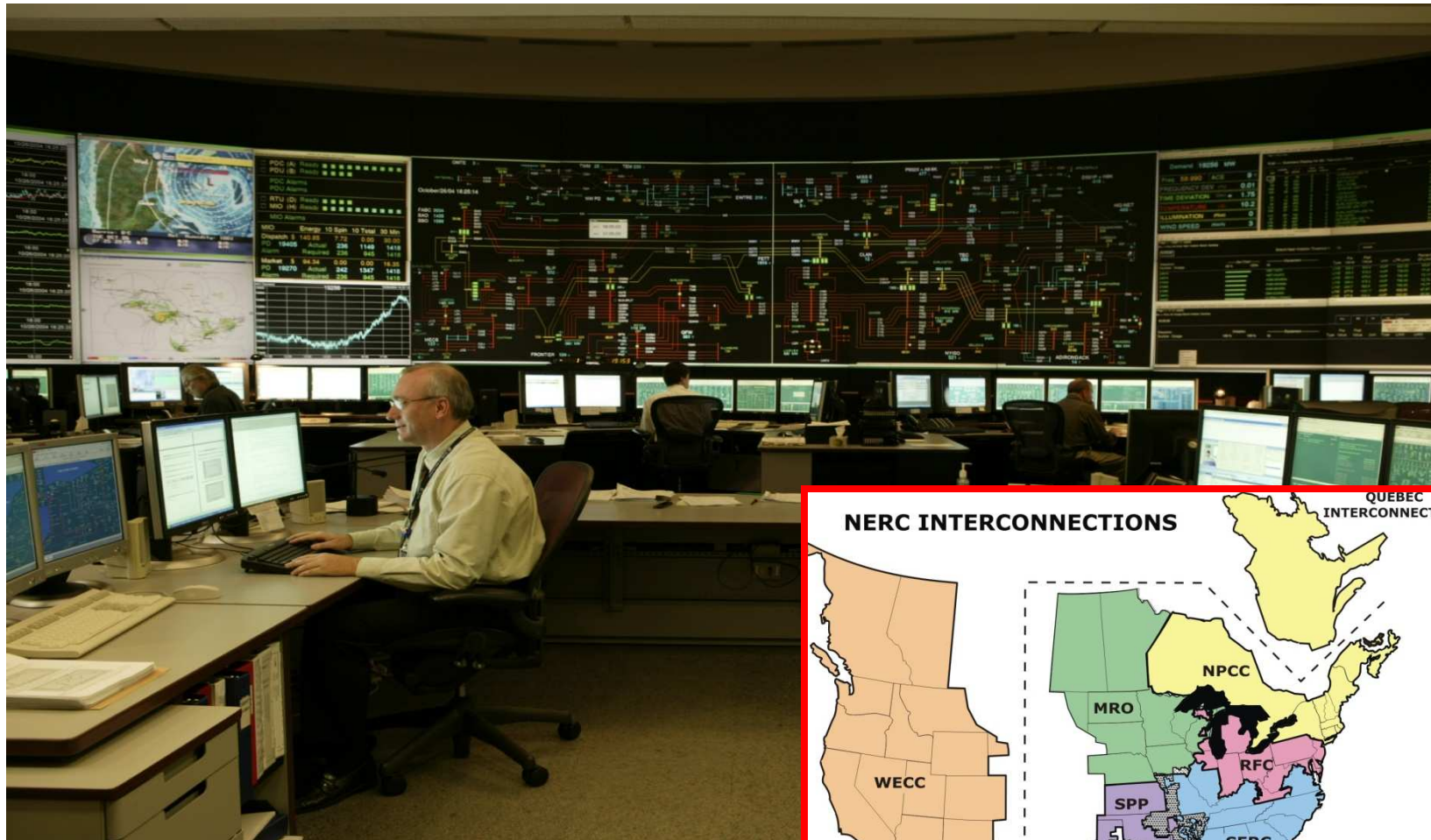


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Facilities

- ▶ PowerSimulator with EPRI-OTS
- ▶ Includes generic system and several custom models: Alaska Railbelt System, GCPUD and DCPUD
- ▶ Operators practice roles, real-time decisions, and communication under stress
- ▶ System Operators teach the “Art of Operations” to new and experienced operators - also university, community college, and high school students.

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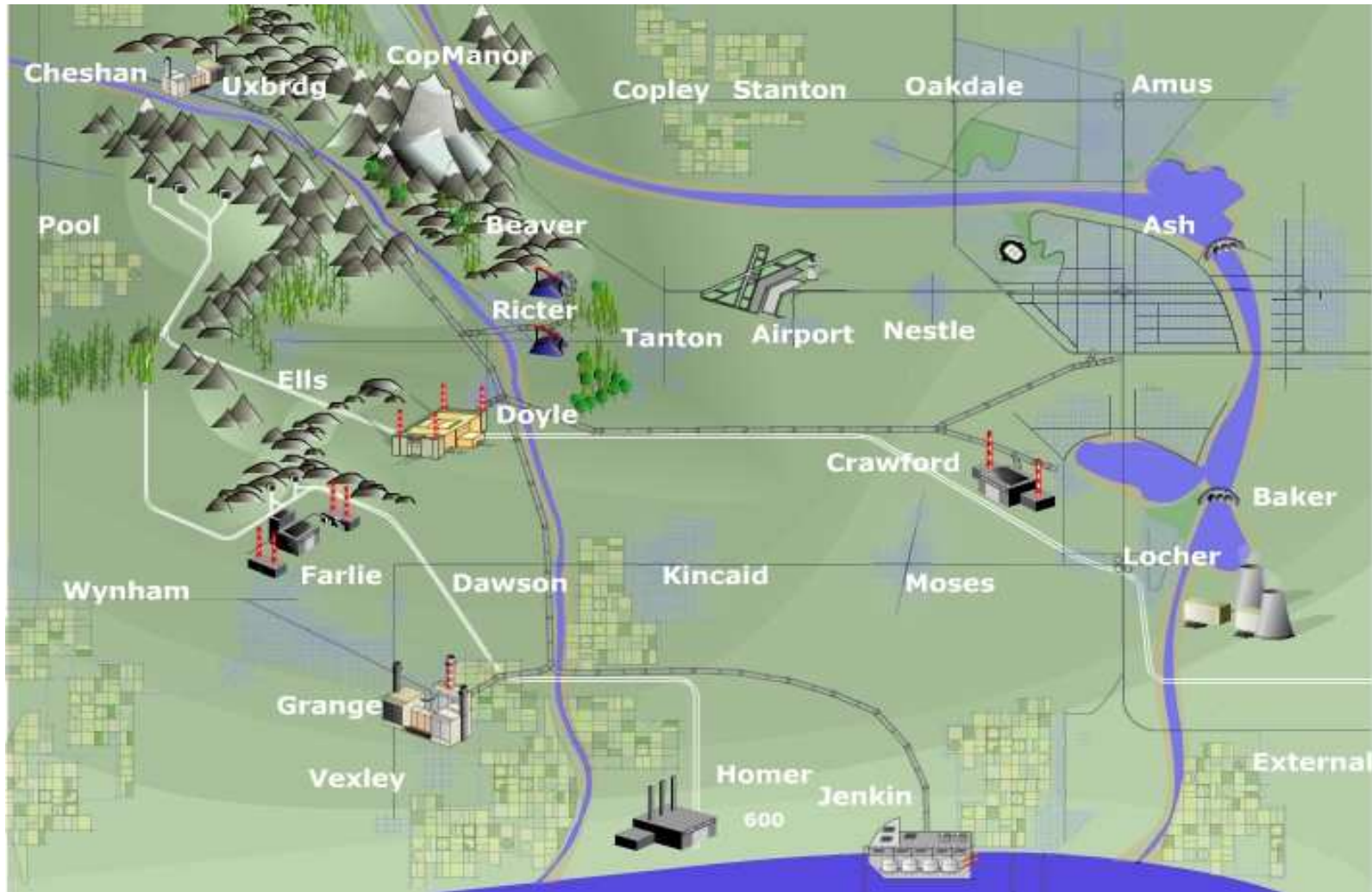
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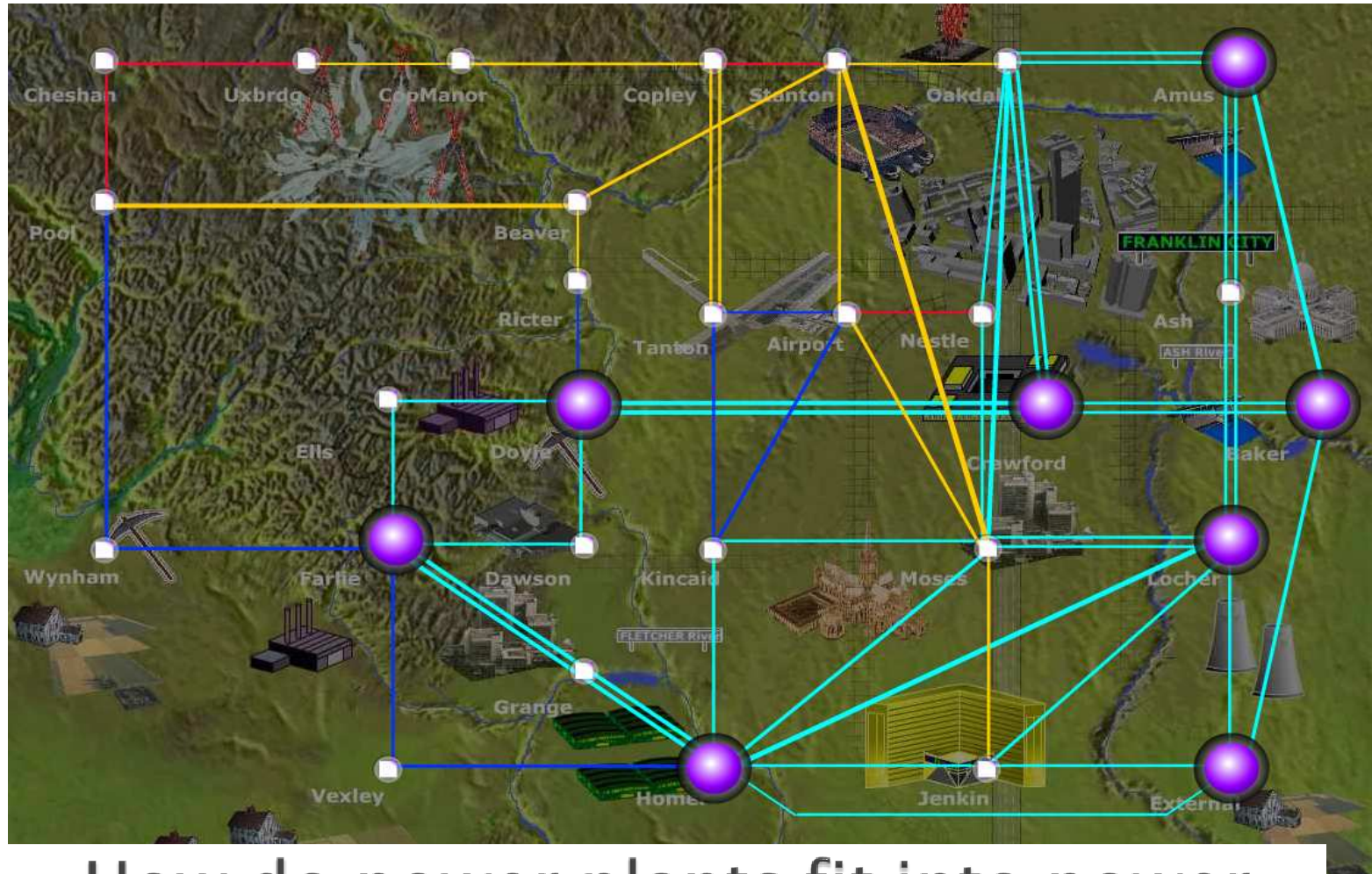
ZagOps



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How do power plants fit into power delivery system?

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Training Details

- ▶ NERC approved courses allow operators an opportunity to use a simulator to practice blackstart restoration procedures, reliability exercises, improve team skills and communication, and to develop a feel for operating a power system under emergency conditions
- ▶ Operators practice roles, communication under stress, and real-time decisions
- ▶ Instructors familiar with NERC operator training material and related activities
- ▶ Responsible for teaching the “Art of Operations” to new and experienced operators - and engineering and high school students

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Training Opportunities

- ▶ Open to students from local universities, community colleges, and high schools to create awareness of job opportunities in utility industry
- ▶ Students participate in special Saturday morning class with regular industry instructor – over **500** High School students in last year
- ▶ Identify non-traditional and under-represented labor sources of recruitment to utility field and open training to these individuals (Avista Apprenticeship programs, High School teachers, military vets, and others)

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Summary

- ▶ Emphasis on T&D engineering courses which meet industry needs
- ▶ Fully equipped and dedicated system operator training facility for power system simulations and blackstart training
- ▶ Opportunity to make a variety of individuals more aware of utility industry job opportunities
- ▶ Used industry resources to build partnerships which allow us to offer focused training aligned with industry needs

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Questions?