DOMINION VIRGINIA POWER

Chesterfield Unit 6 THiHKä Simulator for Control System Checkout and Training Overview

Introduction

Microfusion Engineering Labs (MEL) delivered the Chesterfield Unit 6 Boiler Simulator, built using MEL's THINK (Thermal Hydraulic Integrated Network)™ software to Virginia Power for staging and training purpose. As the result of using THiNK Simulator, Virginia Power were able to reduce Unit 6 commissioning time by more than 3 weeks.

Chesterfield electric generating station Unit 6 is a 700 MW turbo generator first commissioned in 1968. The turbine is a single shaft General Electric machine with single reheat and a hydrogen cooled generator. The boiler is a fossil fueled [coal] designed by Combustion Engineering and tangentially fired twin furnaces with six pulverizers. There are two levels of close-coupled overfire air and three levels of separated overfire air. In addition, the firing system incorporates three levels of warm up oil. Operating design conditions are 4,387,488 lbs/hr at 2400 psig and 1005degF

Controls System Checkout and Functional Testing

Using THINK ™ Simulator, Virginia Power personnel were able to verify, test, and, debug:

- The new Burner Management System
- Combustion & Miscellaneous Controls
- Water/Steam
- Fuel and Air
- The Turbine Control System

Operator Training

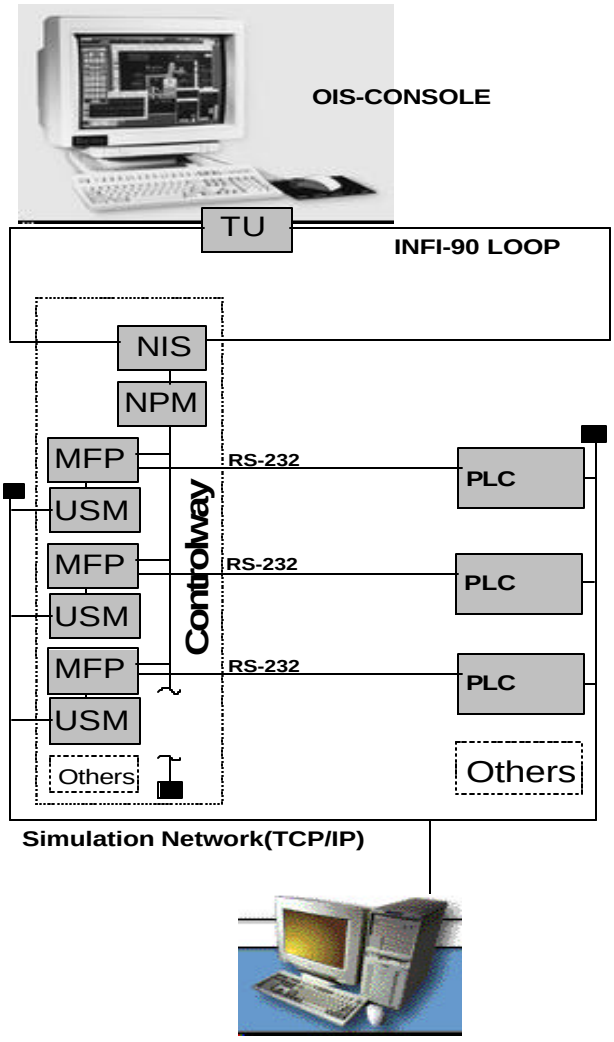
The THiNK™ Simulator was used for operator training after the control system staging was complete. The operators were able to evaluate and test alternative operating procedures for normal and abnormal operation including startup and restart and improve upon the existing operation.

Improved Schedule Performance

Because of using the MEL THiNK™ based boiler simulator for control checkout and operator training, Vapower was able to startup Chesterfield Unit 6 within days after field construction was complete.

Simulation System Scope of Supply

The system diagram shows the system layout and interface to the control systems for Chesterfield Unit 6 THiNK™ Simulator:



The MEL Scope of Supply consists of:

- THINK™ simulation engine running on WindowsNT™
- Modicon PLCs
- Bailey Bridge Controllers (BRC100)
- Bailey Modcon Gateway Interface
- Bailey (ABB) LUSM02 Universal Slave Modules
- PCView Operators Station