Westinghouse Digital EHC System

This five-day course gives students a working knowledge of Digital Electro-Hydraulic Control Systems. The course allows students to become comfortable with its operation by analyzing the system on both a block diagram and circuit card level. The course emphasizes a “nuts and bolts” approach to the DEH system that will greatly enhance the abilities of maintenance and supervisory personnel to perform their jobs.

I. Introduction to DEH
   · Overall System Operation
   · DEH Application Programs
   · Manual Backup Control System

II. Fluid System
   · E-H Fluid System
   · Lubricating Oil and Auto-Stop Oil System
   · Control Function and Interlocks

III. Analog System
   · Manual DEH Control
   · 7300 Series Relay (NRC) Card
   · 7300 Series Digital Input Converter (NDI)
   · 7300 Series Programmable Driver (NPD) Card
   · 7300 Series Input (NCI) Card
   · 7300 Series Servo Driver (NSD) Card
   · 7300 Series Analog Comparator (NAC) Card
   · 7300 Series Analog Mixing Amplifier (NMA) Card
   · 7300 Series Quad-Loop Power Supply (NQP) Card
   · 7300 Series Elco Adapter (NEA) Card
   · 7300 Series Contact Output (NCO) Card
   · 7300 Series Annunciator Interface (NAI) Card
   · Throttle Valve Control
   · Governor Valve Control
   · Throttle Pressure Control
   · Throttle Valve Servo Amplifiers
   · Throttle Valve Additive Position
   · Position Characterizer
   · Governor Valve Servo Amplifiers
   · Governor Valve Additive Position
   · Overspeed Protection Control (OPC)
   · Load Drop Anticipation (LDA)

IV. Computer Basics
   · Introduction to Logic
   · Memories
   · Basic Computer

V. Automatic Control
   · Central Processor Unit
   · Process I/O System
   · External Interrupt Subsystem
   · Contact-Closure Input (CCI) Subsystem
   · Analog Input (AI) Subsystem
   · Digital Speed Channel Subsystem
   · Analog Output Subsystem
   · Contact-Closure Output Subsystem
   · Data Link Subsystem
   · Breaker Open Interrupt Program
· Valve Pushbutton Interrupt Program
· Remote Attention Interrupt Program
· Auxiliary Synchronizer Task
· Stop Initialize Subroutine
· System Error Task
· Contact Input Scan Task
· DEH Control Analog Input Scan Task
· Analog Input Conversion Task
· Operator’s Panel “B” Task
· Valve Pushbutton Task
· Visual Display Task
· Logic Task
· Control Task
· Valve Management (VM) Program
· Tracking Subroutine
· Preset Subroutine
· Control Output Task
· Data Link Programs
· ATC Programs
· ATC Message Writer Task
· CRT Programs
· Logout Task

VI. Digital System Equipment
· External Interrupt Subsystem
· Input and Output Subsystems
· Q Line Centralized I/O Subsystem
· External Interrupt/Service Request (EE) Card
· Isolated Interrupt Filter (XIF) Card
· Sequencer of Event Interrupt (XIS) Card
· 16 Bit DC Input (SCI) Card
· Single-Point Analog-to-Digital Converter (SPA)
· Isolated Digital/Analog Hybrid (XHC) Card
· 7300 Series Speed Channel (NSP) Card
· Contact Output (XCO) Card
· Resettable Contact Output (X CZ) Card
· Direct Digital Output (DDO) Card
· Digital/Analog Controller (DAC) Card

· Process Output Driver (IPO) Card
· Analog Input Point (QAV) Card
· Analog High Level Input Point (QAW) Card
· RT Input Amplifier (QRT) Card
· Universal Input/Output Bus (UJOB) Card
· Bus Extender (QBE) Card
· Crate Paddle (QPD) Card
· Time Base (QTB) Card
· W2500 Input/Output (W10) Card
· Asynchronous Half Duplex Series Interface (WHD) Card
· Paper Tape Reader (PTR) Card
· Teletype Beehive Board (TTB and TTY)

VII. W2500 Computer
· Function
· Basic Operation
· Interconnections