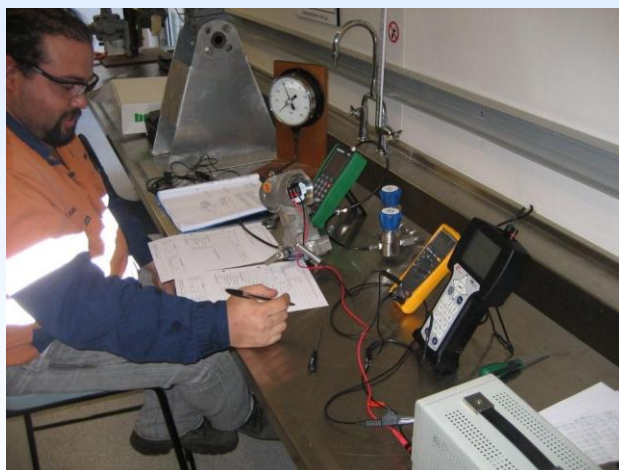


Challenger TAFE / ACEPT INSTRUMENTATION COURSE



For IICA AGM 7th
April 2009 - Perth



 Challenger TAFE

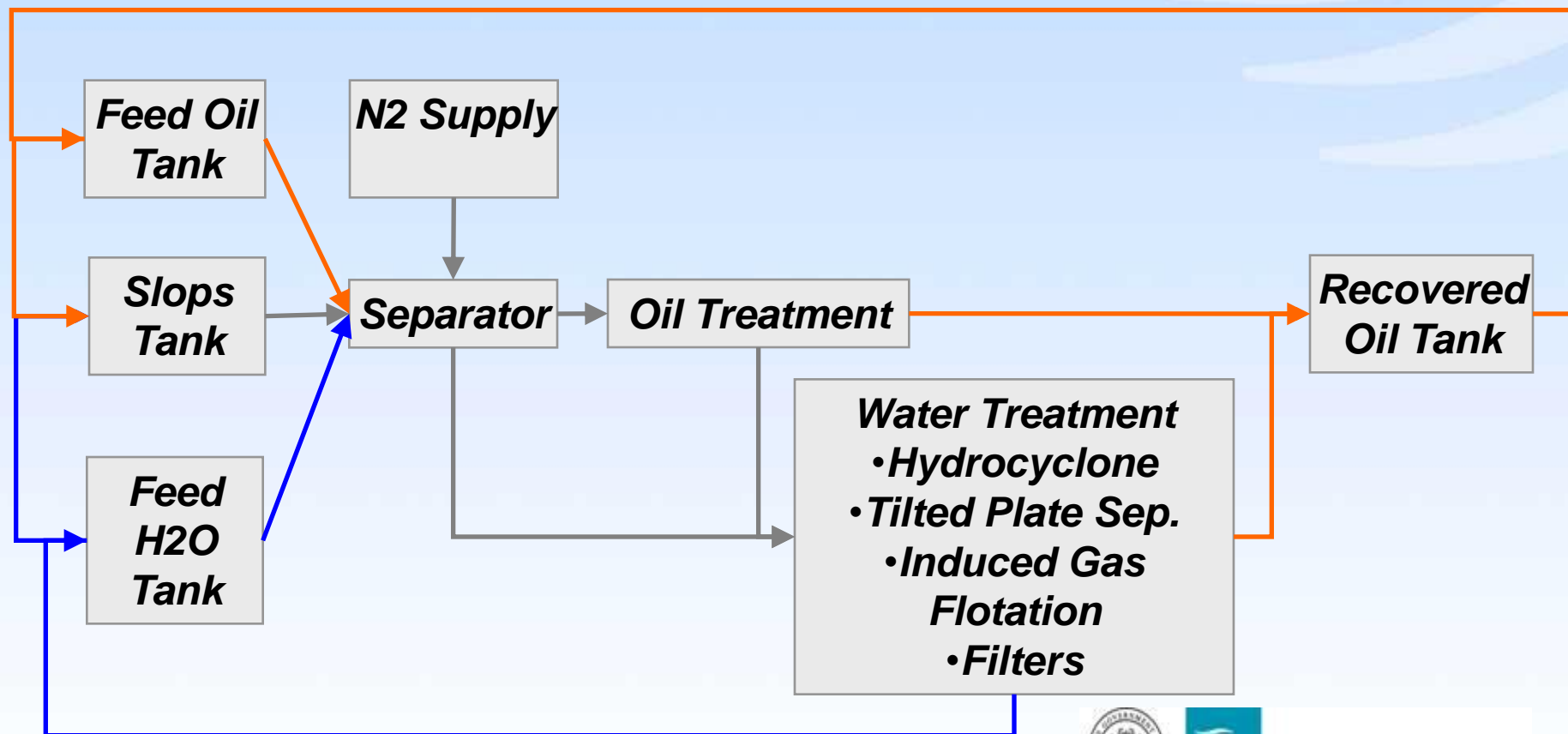
Australian Centre for Energy and Process Training



ACEPT offers Instrumentation and Process Operations courses



The ACEPT Process Plant Oil and water separation facility



The ACEPT Process Plant



ACEPT Equipment

The centre features:

- Process controllers supplied by Honeywell
- A full scale simulation of the process train developed by Honeywell
- A Yokogawa simulation of a distillation tower, instrument air, furnaces and heat exchanges
- Virtual Refinery Distillation simulation of a distillation system with loop tuning features
- A fully operational closed loop methanol distillation tower (2009)



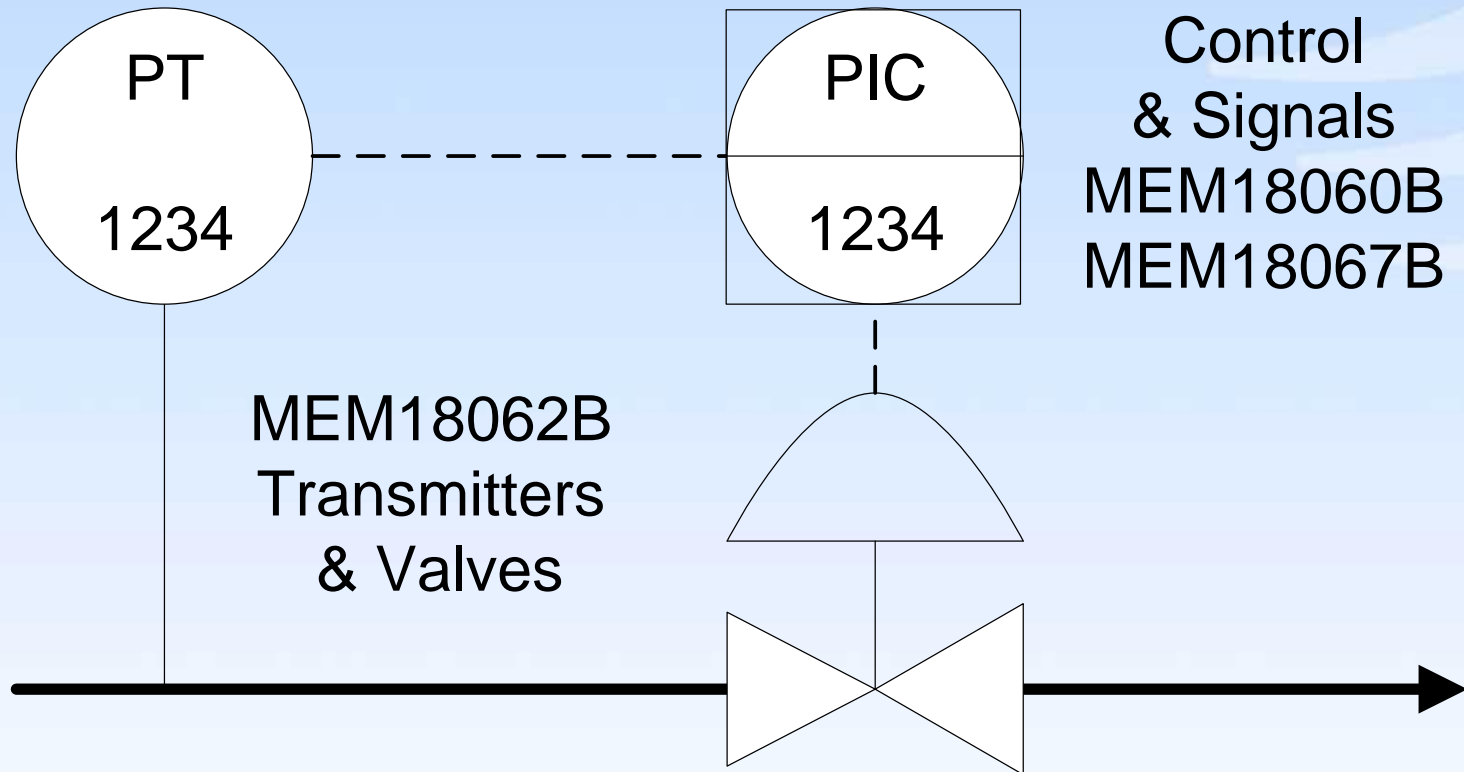
WT46 Certificate IV in Engineering (Instrumentation) MEM40105

for

Australian Certified
Grade 'A' Electrician
and

Electrical Apprentices in stage 2, 3, or 4

UNITS

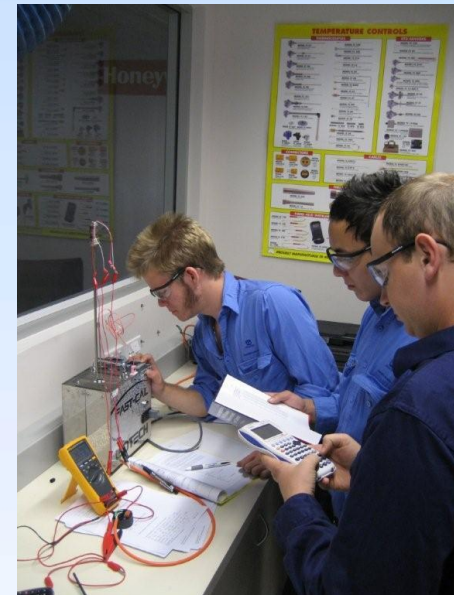


Foundation Principles MEM18054B & MEM18064B

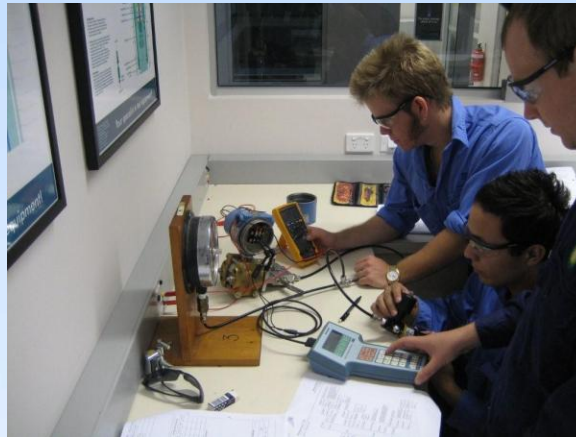
PRACTICALS

FUNDAMENTALS

PRESSURE, SIGNALS, TEMPERATURE, LEVEL,
FLOW, DENSITY, CONTROL VALVES, CONTROL
LOOP PRINCIPLES, FAULT FINDING AND
ROUTINE MAINTENANCE ON ACEPT PROCESS
PLANT



PRACTICALS



PRACTICALS



PRACTICALS



WORKSHOP / CLASSROOM



Fume Cupboard



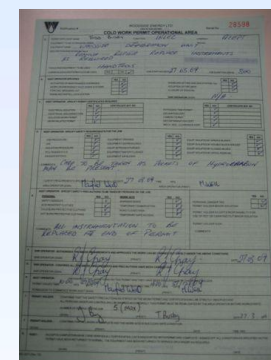
ACEPT PROCESS PLANT



Muster Board



Control Room

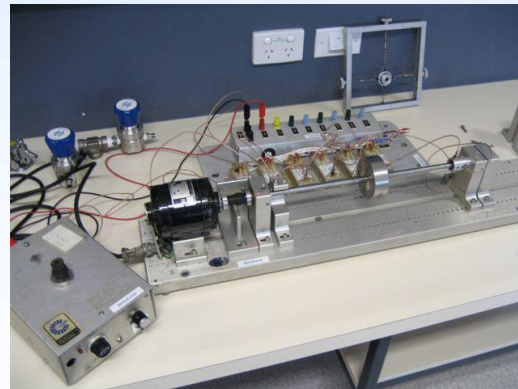
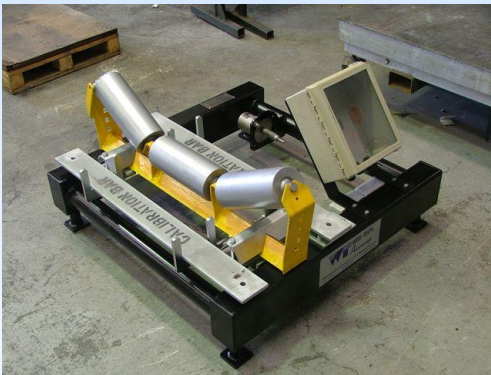


Permit System

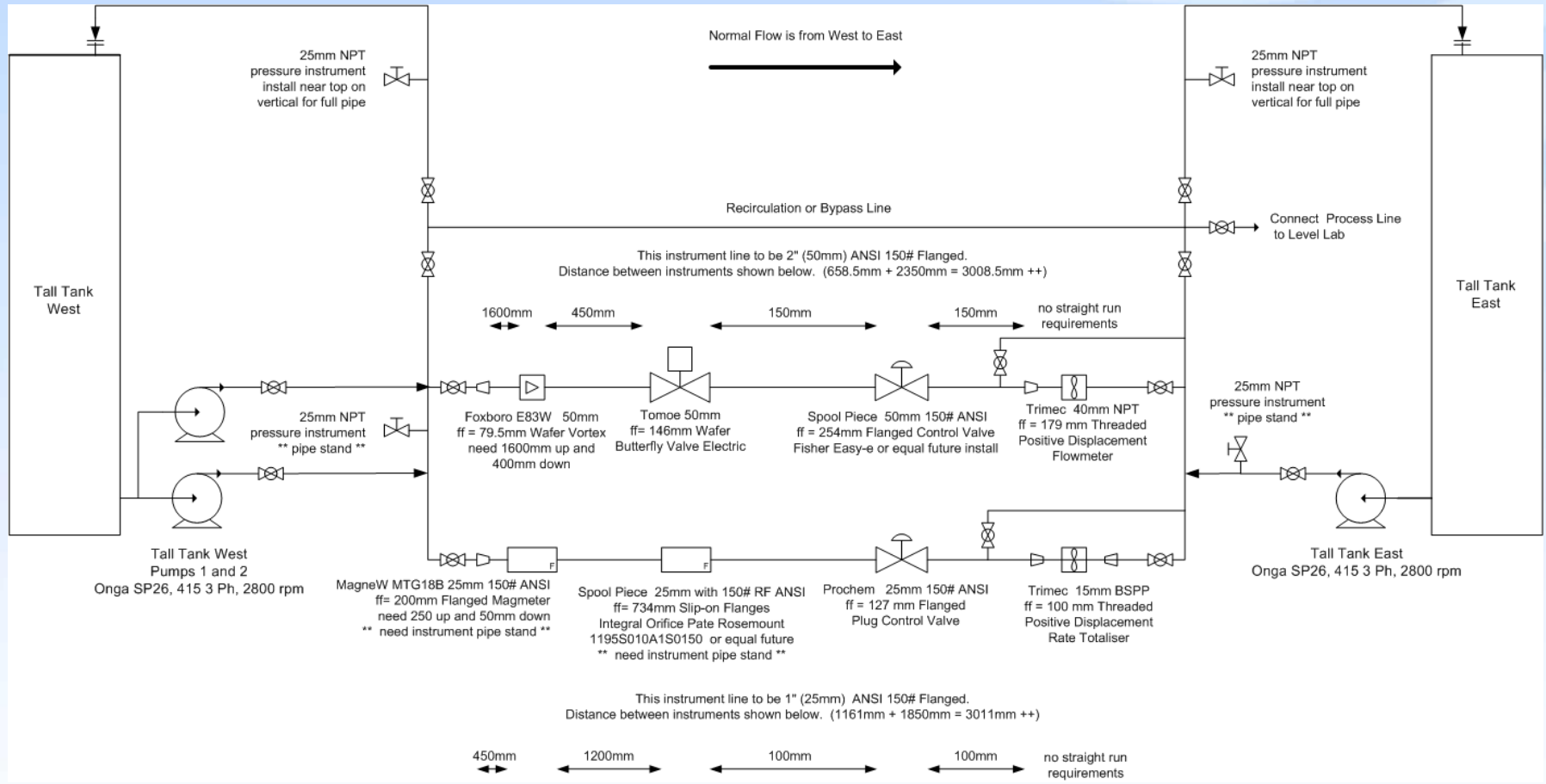
PRACTICALS

IN DEVELOPMENT

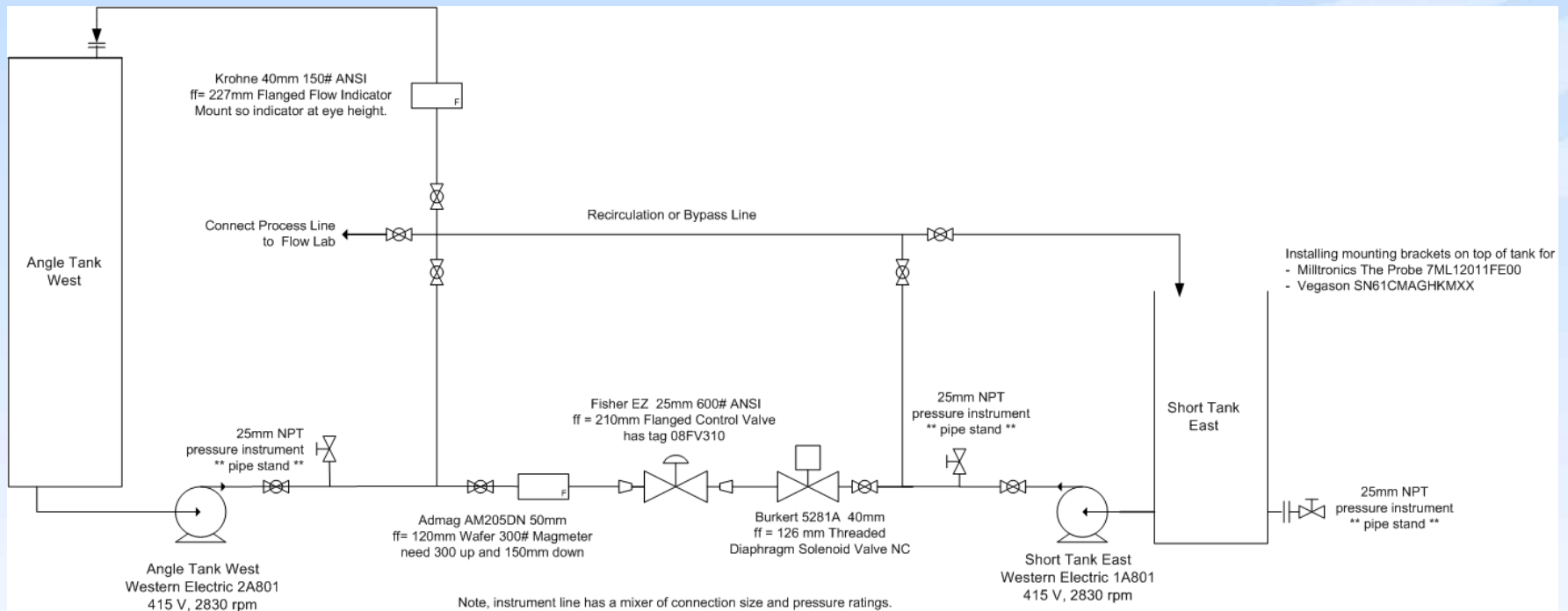
WEIGHTOMETER, VSD, HUMIDITY, WATER ANALYSIS, HAZARDOUS AREAS,
WIRELESS, SMOKE DETECTION, GAS DETECTION, VIBRATION



FLOW LAB



LEVEL LAB



PRACTICALS

WHERE WE STILL NEED ASSISTANCE

FIELDBUS, PROFIBUS, CONTROLLERS, FIELD EQUIPMENT, VARIOUS
VENDOR EQUIPMENT, TEST EQUIPMENT, NEW TECHNOLOGIES

WHERE TO FROM HERE?

WE WANT FEEDBACK FROM INDUSTRY ON WHERE THEY WANT SKILLS
INCREASED, ALSO ASSIST WITH TECHNICAL INFORMATION

SUPPORTERS OF THE PROGRAM

Test Equipment

LEDA
ELECTRONICS PTY. LTD.

FLUKE



MICHELL
Instruments

LES COOKE INSTRUMENT CO PTY LTD



**Industrial
Technologies**
division of BIOLAB



GE Druck



ZEDFLO
AUSTRALIA

BETA
CALIBRATORS
MARTEL
ELECTRONICS



RS

Temperature °Ccontrols

KD INSTRUMENTS
SPECIALIST IN INDUSTRIAL INSTRUMENTATION

AMS INSTRUMENTATION & CALIBRATION
SPECIALISTS

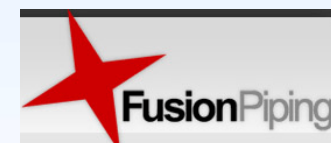
beamex



Challenger

SUPPORTERS OF THE PROGRAM

Field Equipment



THEORY

FOUNDATION PRINCIPLES

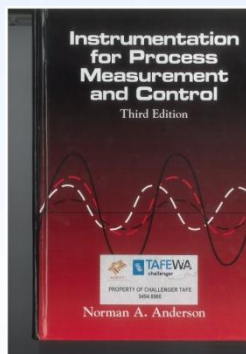
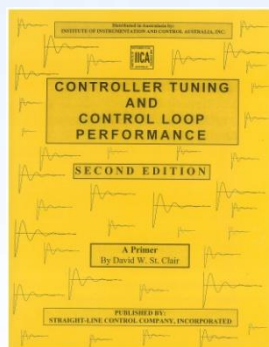
PRINCIPLES - DWG & SPEC - ISOLATION - CAL & TEST - FAULT FINDING

TRANSMITTERS & VALVES

TRANSMITTERS - LEGISLATION - INSTALLATION - VALVES - FLOW

CONTROL & SIGNAL

HAZARDS & MEASUREMENT - CONTROLLER - PLANT - SYSTEMS - SIGNALS



Challenger

THEORY

MEM40105 Certificate IV in Engineering (Instrumentation)

Foundation Principles					Transmitters and Valves					Control and Signals				
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
PRINCIPLES	DWG & SPEC	ISOLATION	CAL & TEST	FAULT FINDING	TRANSMITTERS	LEGISLATION	INSTALLATION	VALVES	FLOW	HAZARDS & MEAS	CONTROLLER	PLANT	SYSTEM	SIGNALS
UNITS Conversions Fittings Pipe Size Tubing 4-20 mA MATH REVIEW Rules SI Prefixes Meas Value Output DENSITY Formula Measure Density/Values Std Temp-Press SPEC GRAVITY Liquid Air FORCE Formula PRESSURE Pascal's Law Press Formula Static Formula Atmospheric Types TEMPERATURE Heat vs Temp Energy Formula	SYMBOLS ISA Bubble Location Loop Number Control System Computation Instrument Identifications Signals DOCUMENTS Data Sheet Index Location Dwg Loop Diagram Instr Cable Sch Instr JB Dwg Rack Drawing I/O Schedule Instr Power Sch Manuf Data Sh Maint Manuals P&ID PROC FLOW PROCEDURES	ISOLATION Instrument Process Spool Piece Signal Electrical Control System Duty Standby SHUTDOWNS Plant Scheduled Unscheduled WORK PERMIT What is Reduce Risk Cold Work Permit Hot Work Permit Confined Space Excavation Permit Bypass Cert Blind List Elec Permit Limitations RESPONSIBILITY Permit Issuer Permit Holder Closing off	MEASURE Cert. Std NMI Acc Repeat Range Limits Span Errors Supp & Elev Display INSTR SPEC Errors Limits Range Press Limits Temp Limits Materials IO Inputs Outputs Why 4-20 mA HART Fieldbus Wireless Contacts Power Supply 2 Wire 4 Wire 240 Vac Battery TEST EQUIP Communicator Press Source Temp Source Level Source Flow Source Gas Detector Analyser CALIBRATION Reasons Steps	FAULT FINDING Solutions Toolbox Root Cause Perception Methods Look/Tug Elimination Maint Manual	PRESSURE Textbook Internet Types WEIGHT Textbook Internet Types LEVEL Textbook Internet Types DENSITY Textbook Internet TEMP Textbook Internet Types HUMIDITY Textbook Internet ANALYTICAL Textbook Internet Types SOFTWARE Excel WS	REASON ACTS REGULATIONS List STANDARDS Reason Comparing Application Australian Purchasing Organizations List	HAZARDOUS AREA Overview Area Classification IEC Area Class. American Area Class. IEC Protection Types Intrinsic Safety Cable IS ENCLOSURE RATING IP NEMA Comparison CABLES Cable Introduction Twisted Pair Noise Rejection Common Mode Crosstalk Electromag Noise Electrostat Noise Cable Components Cable Size Ground Shield Typical Australian Standard PIPE & TUBING Pipe Introduction Definition of DN Definition of PN Piping ASME to PN Diameter INSTRUMENT AIR Quality Supply Press Fittings Video Tubing COMMISSIONING Phases Punch List Precommissioning Recommissioning Test Reports SELECTION	VALVE Performance Sizing Selection ASSEMBLY Actuator Positioners Actuator Sizing CV Action PNEUMATIC Pneumatics MAINTENANCE Control Valve VALVE TYPES Characteristics Globe Valves Needle Valves Butterfly Valves Ball Valves Plug Valve Diaphragm DETAILS Action Automatic Valve Actuators Pneumatic Diaphragm Rotary Electric Engaging MOV Operation MOV Hydraulic Valve Solenoid OPERATING MAIN. DETAILS Identification Leakage Inspection Safety Dismantling Lubricant Seat + Thread Packing Stuffing Box Nut + Gland	REVIEW Liquid Gas Gauge Press Absolute Press Vacuum Manometers Temp heat Force PRINCIPLES Viscosity Velocity Reynolds No Laminar Flow Turbulent Flow Flow Head Loss ORIFICE PLATE Application Material Calculation Installation Straight Run Bore Square Root Mass Flow Wet Leg Manifolds MAGMETER Application Materials Grounding Location Cable CONTROL VALVE Location Recovery ISOLATION START-UP INSPECTION	CONTROL HAZARD Workplace Major Hazard Facility MHF Regulations A Safety Case Reduction Identifying Assessing Action Procedures CALIBRATION Calibration Temperature MEASUREMENT Appropriate Units Scales Correct Range Expected Range Process Variables Process Log Sheet SOP Range of Results External Factors Environ Conditions Movement Process Conditions External Activities Physical Properties Techniques Safety Accuracy Practice Checking Faulty Record SWITCH Contacts	CONTROLLER Process Control Feedback Single Controller PID Step Method Frequency Ratio Cascade Feedforward	ACCEPT AIR NITROGEN SEPARATION WATER CHEMICAL PIG Sketch Overview Warnings Specifications Equipment Process Control Emerg Shutdown Interlocks SOP	SYSTEM DCS SCADA PLC TUNING	HISTORY MANUAL PNEUMATIC 4-20 mA HART PROFIBUS FIELDBUS WIRELESS

SIMULATOR by Simulation Solutions

Simulator Configuration

SS500: Simulator System
Simulator Version : v1.71

Event Log

☒ Enable Event Log
☐ Disable Event Log

Momentary Switches

☐ Enable Emulator Momentary Switches
☒ Disable Emulator Momentary Switches

DCS Menu Options

☒ Display Windows Style Menu
☐ Display DCS Style Menu

DCS Keyboard

☐ Enable Keyboard ☒ Disable Keyboard

N/A

I/O Port : COM2

Instrument Control Display Option

Generic Faceplate Control

Generic Faceplate Control
TDC 3000 Faceplate Control
Honeywell GUS Faceplate Control
Foxboro Faceplate Control
Yokogawa CS Faceplate Control
TDC3000 Emulator

Emul

Instrument Change Confirmation

☐ Enable Instrument Change Confirmation
☒ Disable Instrument Change Confirmation

Outside Operator

☒ Local Outside Operator
☐ Remote Outside Operator

Main Window Size

800 X 600

OK Return

Indicator

P1110
REBOILER

0.000 to 4.000 KGCM2

pv: 1.817 KGCM2

Detail Close

Switch

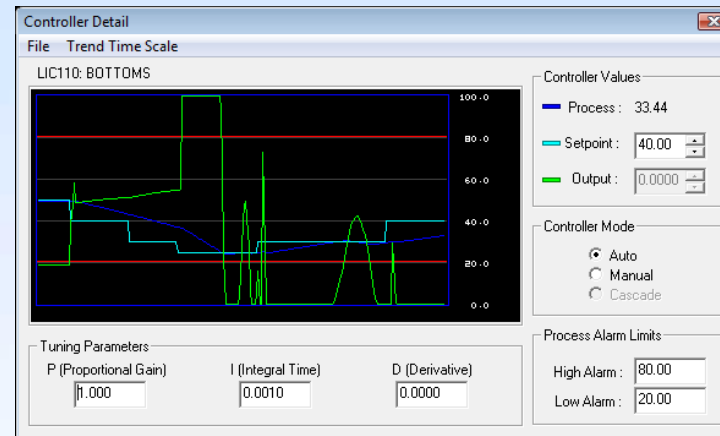
HS127
STEAM

Command:

☒ OPEN
☐ CLOSE

Status:
OPEN

Return



Controller

FIC121
REFLUX

0.00 to 70.00 M3/H

sp: 27.29 M3/H

pv: 27.29 M3/H

out: 37.46 %

Mode

☐ Automatic
☐ Manual
☒ Cascade

Detail Close

DCS Emulation Help

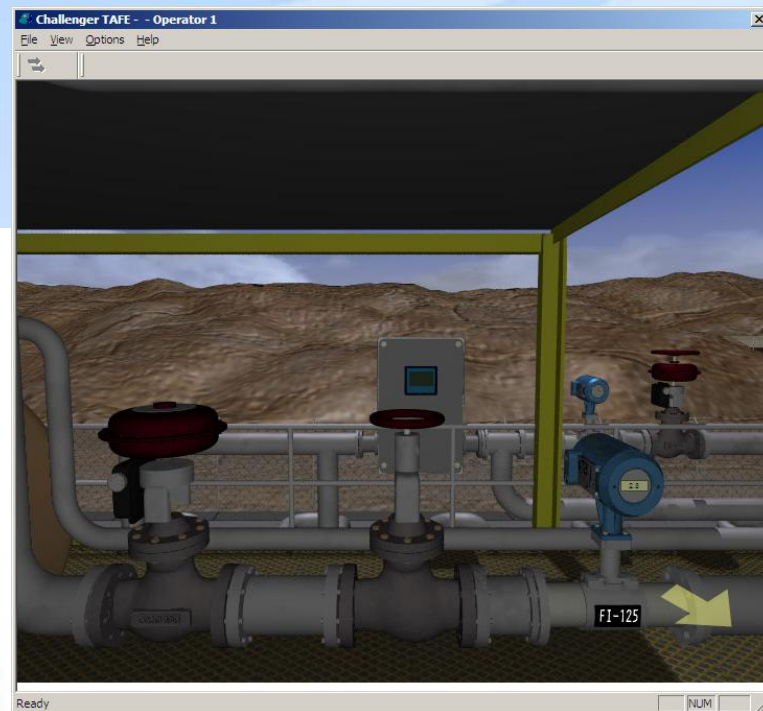
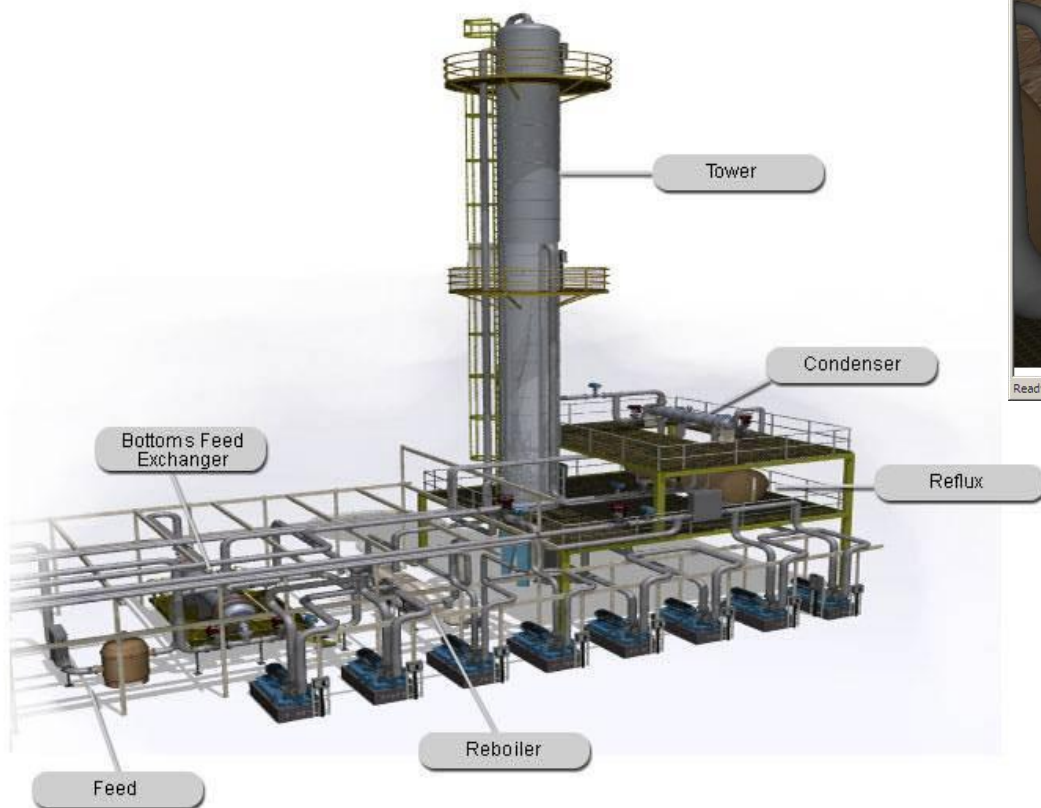
File Edit Bookmark Options Help

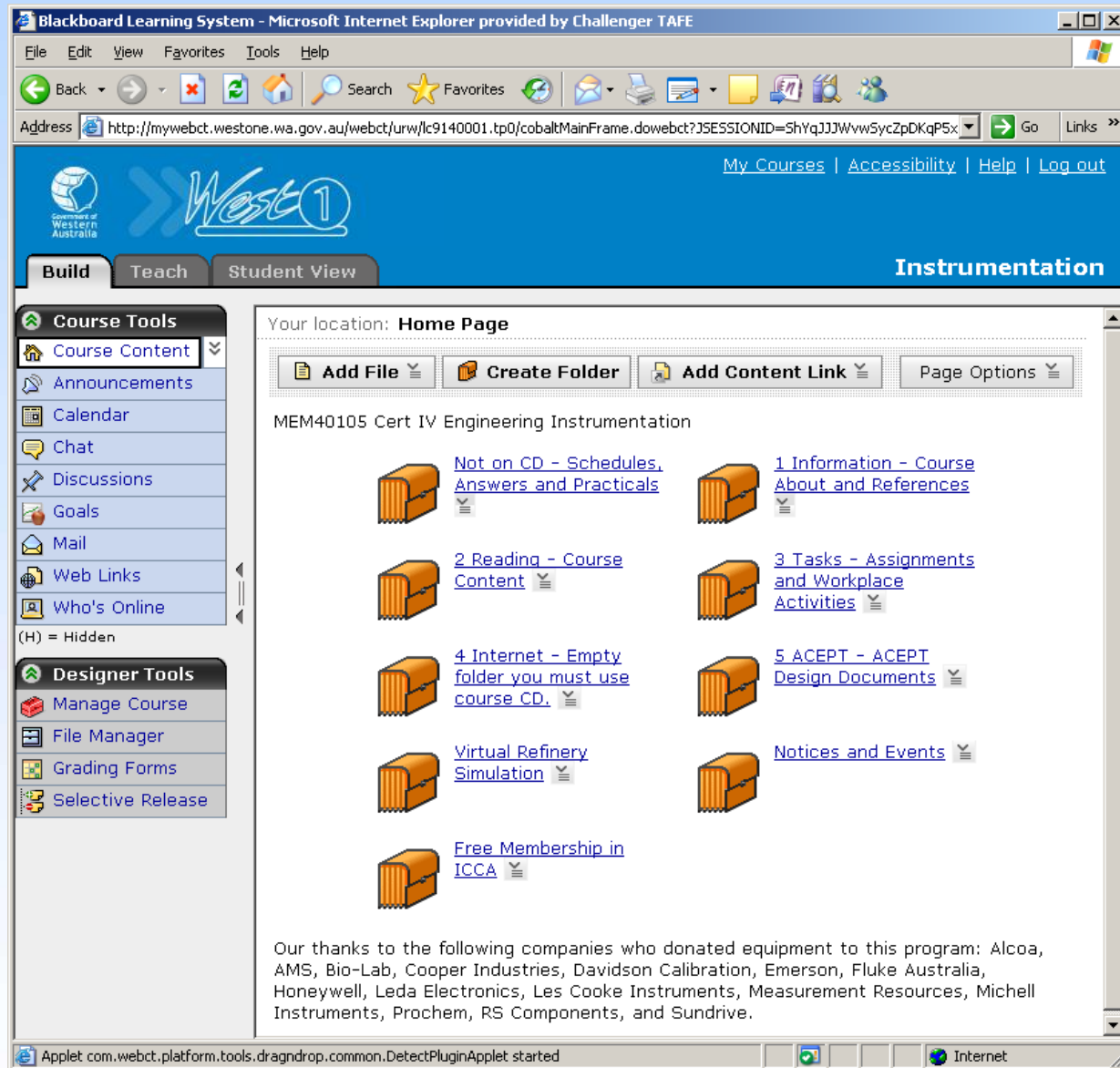
Contents Index Back Print << >>

The controller in a cascade control system whose control point is adjusted by the output of the master controller. Also known as the secondary controller in a cascade control system.

SIMULATOR

Plant Walk Around View





Blackboard Learning System - Microsoft Internet Explorer provided by Challenger TAFE

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address <http://mywebct.westone.wa.gov.au/webct/urw/lc9140001.tp0/cobaltMainFrame.dowebct?JSESSIONID=ShYqJJJWwvSycZpDKqP5x> Go Links >>

My Courses | Accessibility | Help | Log out

Build Teach Student View Instrumentation

Course Tools

- Course Content
- Announcements
- Calendar
- Chat
- Discussions
- Goals
- Mail
- Web Links
- Who's Online

(H) = Hidden

Designer Tools

- Manage Course
- File Manager
- Grading Forms
- Selective Release

Your location: Home Page

Add File Create Folder Add Content Link Page Options

MEM40105 Cert IV Engineering Instrumentation

- Not on CD - Schedules, Answers and Practicals
- 1 Information - Course About and References
- 2 Reading - Course Content
- 3 Tasks - Assignments and Workplace Activities
- 4 Internet - Empty folder you must use course CD.
- 5 ACEPT - ACEPT Design Documents
- Virtual Refinery Simulation
- Notices and Events
- Free Membership in ICCA

Our thanks to the following companies who donated equipment to this program: Alcoa, AMS, Bio-Lab, Cooper Industries, Davidson Calibration, Emerson, Fluke Australia, Honeywell, Leda Electronics, Les Cooke Instruments, Measurement Resources, Michell Instruments, Prochem, RS Components, and Sundrive.

Applet com.webct.platform.tools.dragndrop.common.DetectPluginApplet started

WebCT

- Communication
- Issuing Files
- 24/7 Access
- Identify Donations
- Fun Stuff

CONTACT INFORMATION

ACEPT (Australian Centre for Energy and
Process Training)
Challenger TAFE WA
735 Rockingham Road
Munster WA 6166
Main (08) 9494 8900
Fax (08) 9437 4850
Web www.challengertafe.wa.edu.au

Main contact for information between hours of 8-3 is:

Judith Thorpe

Direct Line (08) 94948910

judith.thorpe@challengertafe.wa.edu.au

Additional contact (limited availability) is:

Olive MacKay

Instrumentation Lecturer

Direct Line (08) 9494 8924

olive.mackay@challengertafe.wa.edu.au