Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. FIC-307-1		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV / SHEET OF

3.0 OPERATION

3.1 NORMAL OPERATION

Typical flow control loop.

3.1.1 Startup

3.2 INTERLOCKS

None.

3.3 ABNORMAL OPERATION

3.3.1 Air Failures

Air failure to the loop will cause the furnace to shutdown.

3.3.2 Power Failure

Power failure to the loop will cause the control valves to close shutting down the furnace.

PCB-ARCH-EXT0374136

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. FIC-307-1		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV 1 / SHEET OF

1.0 FURNACE FUEL FLOW CONTROLLER

The fuel flow and thus the furnace firing level serves as the basis of the column vapor through-put. This is the primary instrument concerned with column capacity.

1.1.1 Function

The function of this loop is to control the flow of fuel gas or fuel oil to the reboiler furnace.

1.1.2 System Performance Required

1.1.3 Accomplishment of Function

The fuel gas flow is controlled by measuring the rate of flow in the line via an orifice plate and differential pressure transmitter. The D/P transmitter sends a 3-15 psig signal to the indicating controller. The controller compares this signal with a set point and sends a carying 3-15 psig signal to the fuel gas control valves to compensate for variation from the set point.

When using fuel oil the measurement is made using an integral orifice. D/P transmitter, a switch on the field panel, selects either fuel gas or fuel oil operation and at the same time selects the D/P transmitter for that service, and either the fuel gas or fuel oil control valves. One, two or three burners can be used. Each one having its on control valve which can be selected from the field panel.

PCB-ARCH-EXT0374137

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. FIC-349-1	
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY / DATE	REV 1 / SHEET OF

1.0 NO. 5 ABSORBER FEED FLOW CONTROLLER

This controller regulates the feed rate through and thus the ΔP across No. 5 absorber to allow the (exist) 538 feed pump to operate within its head-volume capability.

1.1 DESCRIPTION

1.1.1 Function

The function of this loop is to measure and control the flow by feed to No. 5 absorber and to provide an alarm on low flow.

1.1.2 System Performance Required

1.1.3 Accomplishment of Function

The feed flow is controlled by measuring the rate of flow with an integral orifice differential pressure transmitter. The D/P transmitter sends a 3-15 psig signal to the indicating controller. This signal is compared to a set point and the controller sends a varying 3-15 psig signal to the control valve FV-349-1 to compensate for variation from the setpoint.

A pressure switch activates an alarm on low flow.

PCB-ARCH-EXT0374138

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. FIC-349-1		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV / SHEET OF

3.0 OPERATION

3.1 MANUAL OPERATION

Typical flow loop.

3.2 INTERLOCKS

None.

3.3 ABNORMAL OPERATION

3.3.1 Air Failures

Upon air failure to the loop the valve will close and the alarm will sound.

3.3.2 Power Failure

Upon power failure the alarm will be inoperative.

PCB-ARCH-EXT0374139

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. FIC-307-1		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV / SHEET OF

3.0 OPERATION

3.1 NORMAL OPERATION

Typical flow control loop.

3.1.1 Startup

3.2 INTERLOCKS

None.

3.3. ABNORMAL OPERATION

3.3.1 Air Failures

Air failure to the loop will cause the furnace to shutdown.

3.3.2 Power Failure

Power failure to the loop will cause the control valves to close shutting down the furnace.

PCB-ARCH-EXT0374140

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. PICA 301-5	
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY / DATE	REV / SHEET 1 OF

1.0 COLUMN PRESSURE CONTROLLER

The column head pressure needs to be controlled (40 mm for 1016; 360 mm for "mono") to limit the still pot liquid temperature to a maximum of 300°C at 140 mm. The still pressure is set by the approximate 100 mm overall column ΔP for both operation.

1.1 DESCRIPTION OF LOOP

1.1.1 Function

The function of this loop is to indicate and control the column's absolute pressure and active an alarm in the control room on high pressure.

1.1.2 System Performance Required

1.1.3 Accomplishment of Function

The column pressure is sensed at the top of the column by an absolute pressure type pneumatic transmitter. The transmitter sends a 3-15 psig signal to a local indication, a pressure switch in the field cabinet for the alarm function, and to an indicating controller mounted on the panel in the control room. The controller compares the signal with the set point and sends a compensating signal to the control valve. The control valve bleeds air into the vacuum system.

The pressure switch activates an alarm when it senses an abnormally high input signal.

PCB-ARCH-EXT0374141

Monsanto	INSTRUMENT FUNCTION OUTLINE	CED LOOP NO. PICA 301-5	
	PLANT W. G. Krummrich	ISSUED BY C. J. Hans. DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00 / AUTH NO. 2417	REV. BY / DATE	REV / SHEET OF

3.0 OPERATION OF LOOP

3.1 NORMAL OPERATION

Same as for a typical pressure loop.

3.2 INTERLOCKS

None.

3.3 ABNORMAL OPERATIONS

3.3.1 Air Failure

Upon instrument air failure to controller, the valve will close, preventing air from being bled into the vacuum system. This would take all control of the vacuum system away from the controller. The vacuum system would lower the column down to its inherent limits.

3.3.2 Power Failure

Upon electrical power failure only the alarm would be inoperative.

PCB-ARCH-EXT0374142

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. LRC-305-3		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV / SHEET 1 OF

1.0 STILL POT LEVEL CONTROLLER

This instrument serves two needs: a) level recording for 1016A and "mono"; and b) level control of still pot feed during 1016 semi-continuous operation and the chain feed part of the "mono" operation. This instrument allows a volume of crude feed to enter the still equal to the distillate volume drawn off via FIC 303-1.

1.1 DESCRIPTION

1.1.1 Function

a. To indicate, record the level of liquid in the still pot.

b. To control the level of liquid during semi-continuous operation.

c. To activate and alarm on high or low liquid level.

1.1.2 System Performance Required

1.1.3 Accomplishment of Function

A displacer type level transmitter senses the level and senses a 3-15 psig signal to the level indicating controller and also to the recorder. The controller compares this signal with a set point and send a 3-15 psig signal to control valve FV-305-3 to compensate for variations from the set point.

Two pressure switches mounted in the field cabinet also receive this signal and sound an alarm in the control room upon high or low level.

PCB-ARCH-EXT0374143

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. LRC-305-3		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV / SHEET OF

3.0 OPERATION

Typical flow loop.

3.2 INTERLOCKS

None.

3.3 ABNORMAL OPERATIONS

3.3.1 Air Failure

Upon air failure to the loop the valve will close and the alarm will sound.

3.3.2 Power Failure

Upon power failure the alarm will be inoperative.

PCB-ARCH-EXT0374144

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. FIC-349-1		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV 1 / SHEET OF

1.0 NO. 5 ABSORBER FEED FLOW CONTROLLER

This controller regulates the feed rate through and thus the ΔP across No. 5 absorber to allow the (exist) 538 feed pump to operate within its head-volume capability.

1.1 DESCRIPTION

1.1.1 Function

The function of this loop is to measure and control the flow by feed to No. 5 absorber and to provide an alarm on low flow.

1.1.2 System Performance Required

1.1.3 Accomplishment of Function

The feed flow is controlled by measuring the rate of flow with an integral orifice differential pressure transmitter. The D/P transmitter sends a 3-15 psig signal to the indicating controller. This signal is compared to a set point and the controller sends a varying 3-15 psig signal to the control valve FV-349-1 to compensate for variation from the setpoint.

A pressure switch activates an alarm on low flow.

PCB-ARCH-EXT0374145

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. FIC-349-1		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 811.00	AUTH NO. 2417	REV. BY	DATE	REV / SHEET OF

3.0 OPERATION

3.1 MANUAL OPERATION

Typical flow loop.

3.2 INTERLOCKS

None.

3.3 ABNORMAL OPERATION

3.3.1 Air Failures

Upon air failure to the loop the valve will close and the alarm will sound.

3.3.2 Power Failure

Upon power failure the alarm will be inoperative.

PCB-ARCH-EXT0374146

Monsanto	INSTRUMENT FUNCTION OUTLINE		CED LOOP NO. XCV 303-1 & ~~XCV 303-2~~		
	PLANT W. G. Krummrich		ISSUED BY C. J. Hans	DATE 7/19/71	PLANT LOOP NO.
DIVISION Organic	BLDG/DEPT 246	AUTH NO. 2417	REV. BY	DATE	REV 1 / SHEET 1 OF

1.0 COLUMN TOP-PRODUCT DIVERTOR

These valves are needed to divert top product from the column (Item 301) to various locations depending on the product specifications.

1.1 DESCRIPTION OF LOOP

1.1.1 Function

These valves enable the operator, at his discretion, to divert all product flow either to the MCS 1016 product receiver (Item 542, #4 product tank), to the light ends receiver (Item 328) or back to the column (Item 301).

1.1.2 System Performance Required

1.1.3 Accomplishment of Function

Placing panel switch SS-5 in the "light ends" position opens valve XCV 303-2 and closes XCV 303-1.

All column top product then flows to the light ends receiver (item 328). Placing the switch in the "closed" position closes XCV 303-1 and XCV 303-2 and diverts all top product, as reflux, back to the column (Item 301). Placing the switch in the "product" position opens XCV 303-1 and closes XCV 303-2. This diverts all product to the #4 product tank (Item 542).

PCB-ARCH-EXT0374147

3.0 OPERATION OF LOOP

3.1 NORMAL OPERATION

Typical.

3.2 INTERLOCKS

None.

3.3 ABNORMAL OPERATION

3.3.1 Air Failure

Air failure to the valves will cause both valves to close which puts column on total reflux.

3.3.2 Power Failure

Same as air failure.

PCB-ARCH-EXT0374148