Phase 1 Instruments Controller Exercise 4.

Name :- **Date:-**

Aim - The aim of this exercise is to show the trainee how to 'tune' a control loop to obtain the desired response to a process change.

Read <u>all</u> instructions before starting exercise!

1. Switch on main isolator on wall.
2. Switch on air supplies and isolate PRESSURE VALVE supply.
3. Switch on panel power supply.
4. Ensure top tank and middle tank drain valves are open but SHUT chrome drain valve into main tank (located under worktop) .
5. Push accept button on alarm panel.
6. Switch on operational overrides on panel.
7. Ensure Plant Emergency Shutdown switch is in the NORMAL position
8. Push ACK buttons on the controllers and alarm panel.
9. Push reset button on alarm panel and yellow master reset button on panel.
10. Push main pump start buttons.
11. Open middle tank filler valve to fill middle tank to approx 50% and then STOP main pump.
12. Start FLOW pump. Pump may need to be stopped and restarted to clear air lock.
13. Press the ACK button on the flow controller. All following instructions relate to flow controller.

X refers to the button that is marked TUNE 1 ←

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14. Press X three times until STI 1 is displayed and using the right-hand knob adjust to 1 **.** 00

15. Press "STORE". *ALWAYS press "Store" after inputting a new value for anything.*

16. Press X twice until SPG1 (this is the gain/sensitivity setting of the controller), is displayed.

17. Using the right-hand knob alter the setting on the top display to read 0 **.** 1 and then press the "STORE" button.

18. Press "A/M" button so that the red LED adjacent to M is lit. Adjust knob until right-hand bar is steady at approx 40. Press "A/M" again so A is lit.

19. Ensure the "S" LED is lit (press "D" if not) and make a rapid, about 20% adjustment to the Set point (left-hand vertical bar) using the adjustment knob.

20. The response of the right hand bar will be very slow. The gain now has to be increased (by increasing the value of SPG1 in increments of 0 **.** 1) so that a steady fluctuating response is obtained when the Set Point is altered rapidly as above.

21. When a steady fluctuating response has been obtained, make a note of the gain value (SPG1) and also record the time it takes for the fluctuation to repeat itself (result to be in minutes not seconds). This is value T1.

22. Divide the gain value by 2.2 and enter this value into SPG1. Make a set-point change again and note the response action.

Response with ST1 set to 1.0 and gain set to value obtained from step 22

23. Divide the T1 value by 1.2 and enter this into ST1. (see step 14/15). What effect does this have?

Response with ST1 set to value obtained and gain set to value from step 22

X refers to the button that is marked TUNE 1 ←