Exercises simulator automatisation 3th Bachelor marine engineering

Lab exercises session 1 and 2: LEARN BY OBSERVATION

**Change in behavior of the process when the controlparameters P,I and D are adjusted**

Make the choice ‘MC90’ and set at ‘full ahead loaded’. Take the HFO separator and its temperature controller. In this controller you adjust the P,I and D values. When you adjust these values, you change the setpoint,***so***  ***at each adjustment in a control parameter you change the setpoint,*** and then observe the behavior of the system by trending the temperature. Change the setpoint of the temperature maximal 2°C.

**Don’t make the changes too large and wait long enough before you make any conclusions!**

**Rememeber**

**‘La patience est la virtue de la réussite.’**

**‘Patience is the virtue of success.’**

(Benoît Mbayo, chief engineer and poet)

a)*P controller*: *I=0 D=0*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| P | overshoot | response time | settling time | offset |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 5 |  |  |  |  |
| 10 |  |  |  |  |
| 20 |  |  |  |  |
| 30 |  |  |  |  |
| 50 |  |  |  |  |

b)*I controller*:

*P=1 D=0* (Look at what happens if you set P=0)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| I | overshoot | response time | settling time | offset |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 5 |  |  |  |  |
| 10 |  |  |  |  |
| 20 |  |  |  |  |
| 30 |  |  |  |  |
| 50 |  |  |  |  |
|  |  |  |  |  |

*P=10 D=0*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| I | overshoot | response time | settling time | offset |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 5 |  |  |  |  |
| 10 |  |  |  |  |
| 20 |  |  |  |  |
| 30 |  |  |  |  |
| 50 |  |  |  |  |

c)*PID controller*:

P=10 I=10

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| D | overshoot | response time | settling time | offset |
| 1 |  |  |  |  |
| 5 |  |  |  |  |
| 10 |  |  |  |  |
| 20 |  |  |  |  |

d) some more values to check

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | overshoot | response time | settling time | offset |
| P=1,I=10,D=10 |  |  |  |  |
| P=12,I=40,D=10 |  |  |  |  |
| P=25,I=15,D=20 |  |  |  |  |
| P=12,I=1D=0 |  |  |  |  |
| P=18,I=15,D=20 |  |  |  |  |
| P=10,I=10,D=0 |  |  |  |  |
| P=20,I=20,D=25 |  |  |  |  |