Doc no.:	**Functional Design Specification**	Date: 25/10/2015

Spike

EM-lvlctrl

Functional Design Specification for Manufacturing Control System

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1. EM-lvlctrl

1.1. Unit

Unit Name	Diagram	Process Cell
MyUnit	SampleTank	processcell

1.2. Control Modules

Name
FV-MyUnit-inlet
Agi-MyUnit-1
LT-MyUnit-1

1.3. Commands

1.3.1.1. LvlCtlEnab

```
########################################
# Date Created: 12/08/2015, 13:47:48
# S88 EM1: EM-lvlctrl
# Command: LvlCtlEnab
########################################

def main():
    """Main Function"""

    # turn on the agitator

    opc('Agi-MyUnit-1').CmdOn()



    #get a handle to the control enabled parameter

    myControlStatus = em.PullParameter('ControlEnabled')



    # turn it on

    opc('EM-lvlctrl').UpdateParameter('ControlEnabled', True)

    #myControlStatus.Value = True
```

1.3.1.2. CtlDisable

```
########################################
# Date Created: 12/08/2015, 13:48:17
# S88 EM1: EM-lvlctrl
# Command: CtlDisable
########################################

def main():
    """Main Function"""

    # turn off the agitator...

    opc('Agi-MyUnit-1').CmdOff()

    #get a handle to the control enabled parameter

    myControlStatus = em.PullParameter('ControlEnabled')
```

```
    # turn it off


    opc('EM-lvlctrl').UpdateParameter('ControlEnabled', False)
```

1.3.1.3. RndLvl

```
##########################################
# Date Created: 12/08/2015, 13:48:26
# S88 EM1: EM-lvlctrl
# Command: RndLvl
##########################################

def main():
    """Main Function"""

    # generate random double between 5 and 95
    myrandomlevel = randDouble(5, 95)

    #set simulate flag to true

    opc('LT-MyUnit-1').IsInSimulate = True

    #simulate the level to the value of  random level

    opc('LT-MyUnit-1').Simulate(myrandomlevel)
```

1.4. CFB Code

```
##########################################
# Date Created: 12/08/2015, 12:15:39
# CFB: EM-lvlctrl/CFB
##########################################

def main():
    """Main Function"""

    #get a handle to the control enabled parameter
    #if its enabled, enable level control . if its disabled, disable level control

    myControlStatus = em.PullParameter('ControlEnabled')

    #get a handle to the equipment module level control setpoint

    mylevelsetpoint = em.PullParameter('setpoint')



    #if level control is enabled and if current tank level is less than level control
setpoint, then open inlet valve.
```

```
       if (myControlStatus.Value == True) and (opc('LT-MyUnit-1').Value <
mylevelsetpoint.Value):
           opc('FV-MyUnit-inlet').CmdOpen()


       if (myControlStatus.Value == True) and (opc('LT-MyUnit-1').Value >
mylevelsetpoint.Value):
           opc('FV-MyUnit-inlet').CmdClose()


       if (myControlStatus.Value == False):
           opc('FV-MyUnit-inlet').CmdClose()



       # get a handle to agicutout level


       myagicutoutlevel = opc('EM-lvlctrl').PullParameter('AgiCutOutLevel')


       # if tank level is less than cutout level then turn off agitator


       if opc('LT-MyUnit-1').Value < myagicutoutlevel.Value:


           opc('Agi-MyUnit-1').CmdOff()
       else:
           opc('Agi-MyUnit-1').CmdOn()
```

1.5. Parameters

Name	Description	Units	Value
setpoint	Level control setpoint	perC	79
ControlEnabled	control is enabled flag	Null	False
AgiCutOutLevel	agitator cutout level	perC	15