



Bayer MaterialScience

# Alarm and trip point management

## SmartPlant Requirements

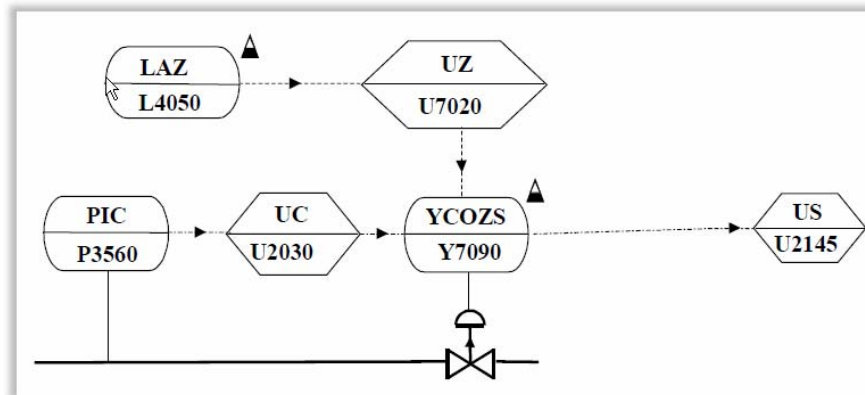
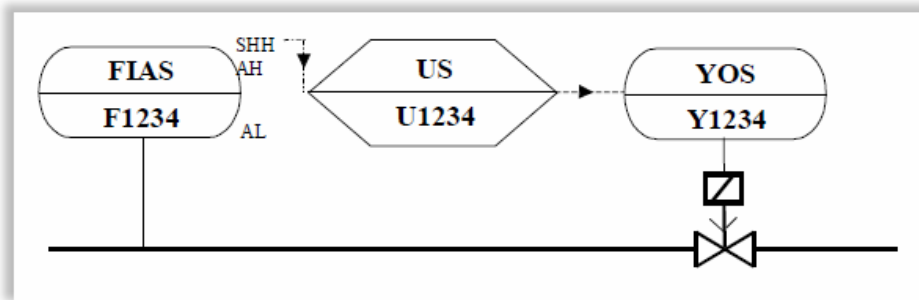
# General assumptions

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- **PCT loops have several tags**
- **Each tag can have several Alarm or trip settings**
- **Tags can have settings, other than “alarm” or “trip”**
  - E.g. a trigger to switch to the next sequence in a process
- **Alarm or trip settings have a relation to process control functions (DCS program), sometimes multiple**
- **Alarm and trip settings need to be administrated outside the DCS.**
  - master of alarm and trip settings should be stored in an engineering database (Smart Plant product), not in a DCS (= live system)
- **Alarm and trip settings are displayed on the P&ID**
  - Not all plants are using SPPID

# Concept

- **Reference:** IEC 62424/ DIN V 44366 and Bayer WN9060P
- Examples how the relation between loops, switch points and control function is displayed on the P&ID:



# Reporting (Excel format preferable)

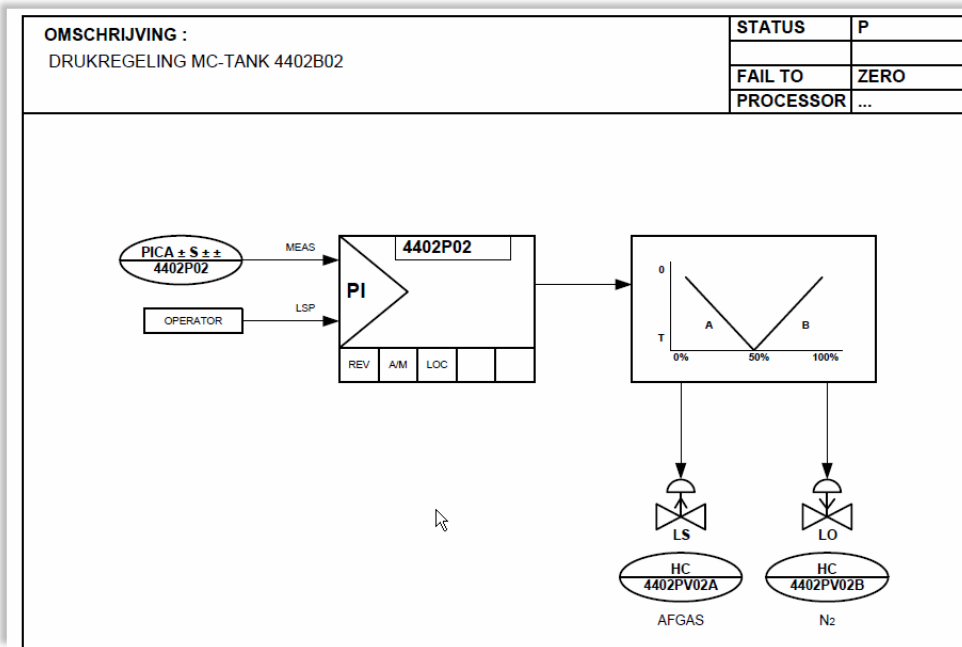
- Example for alarm and trip point settings

Alarm And Trip Point Report					
loop	Tag	Alarm/Trip	Value	UOM/Flag	responsibility
F1000	F1000-FT	ALLL		3 Nm <sup>3</sup> /h	Production Manager
		SHH		50 %	Site manager
W5000	W5000-WG	AH		60 %	Operator
		AHH		80 %	Operator
		AHHH		85 %	Operator
		AHHHH		95 %	Operator
		Overload	MAX Torque		Production Manager
T1200	T1200-TT	CF1		280 °C	Operator

Alarm / Trip	value	UOM	UOM flag ??	Delay on	Delay on time (s)	Condition	Delay time condition (s)	Comments Condition (text)		
SL	5	kg/h		no	-	yes	15			
SH	150	kg/h		yes	5	no	-			
ZLL	2	kg/h		yes	10	yes	15			



# Example control function logic diagram



These logic schematics contain lots of tag names, alarm and trip point settings, so they should reside in SPI

# Alarm and Trip point Requirements

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- **Each alarm or trip setting requires:**
  - Several UDF's for comments (e.g. where the alarm or trip is processed) or user definable custom properties.
  - Value entry not only numerical (e.g. @3 sec)
  - Separated entry (value, UOM, UOM flag)
  - Indication of the type of setting, not only “alarm” or “trip”
  - Delay options, conditions and time settings
  - Comments (notes)
- **Number of alarm or trip settings free configurable per tag (up to 20 or more)**
  - Not limited to HiHiHi - LoLoLo
- **Easy editing interface (browser like) to create new alarm or trip points and enter data.**
  - Instrument ranges
  - Alarm and trip point settings with their properties

# Control function Requirements

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- **Alarm and trip points can have a relation to multiple control functions**
- **Control functions can have relations to multiple tags/loops or other control functions**
- **Ability to manage control function requirements in SPI including logic drawings to feed DCS programmers**
- **Easy to use mechanism to establish “many to many” relations between tags – loops – control functions, others**



# Work around

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- **Since we urgently need to create several alarm or trip points per tag, with several attributes, we started to (mis)use the calibration module.**
- **Calibration module generates records per tag that can (temporarily) hold these data**
- **Data entry in SPI difficult and not accepted by users since the calibration module was not meant for this purpose**

