



Bayer MaterialScience

Alarm and trip point management

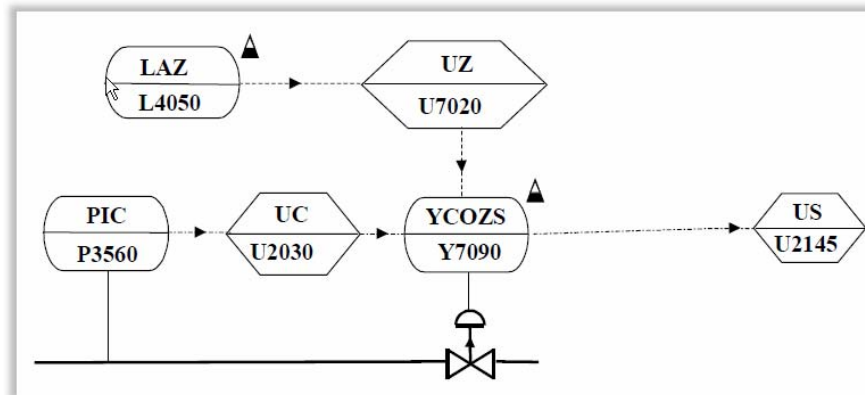
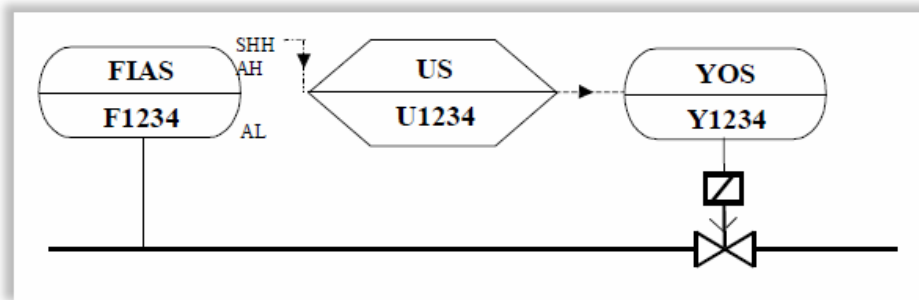
SmartPlant Requirements

General assumptions

- **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:



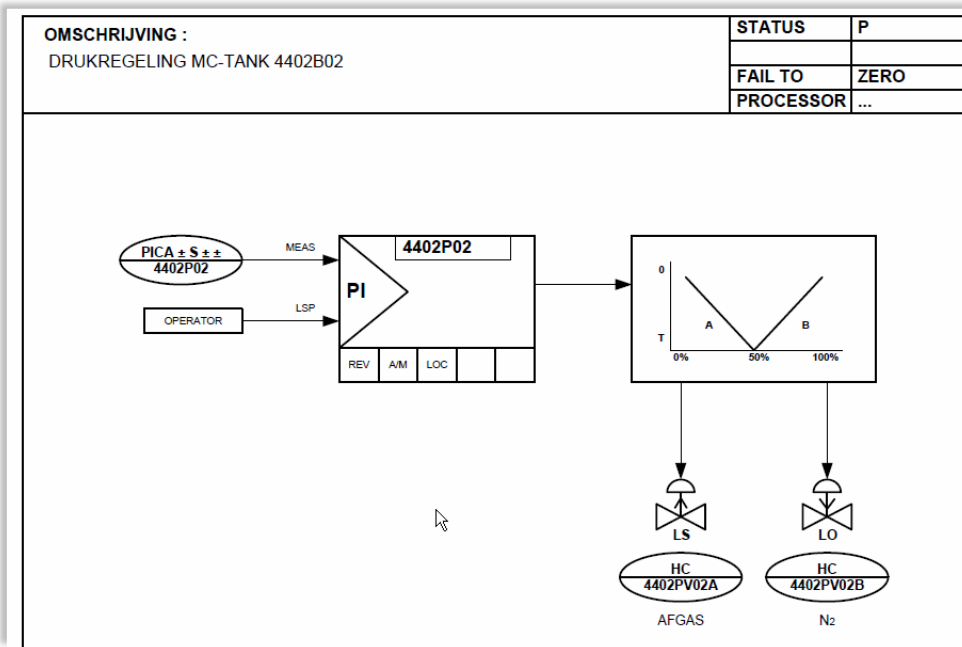
Reporting (Excel format preferable)

- 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 ³ /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

- **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

- **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

- **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**

