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I. Introduction

The graphic displays is a custom - made display wherein plant schematics are drawn such as Piping and Instrumentation with associated process dynamic data and designed to provide necessary information to the operator for a higher reliability and efficiency of controlling and plant monitoring.

II. Window Layout

Refer to ***Annex 1 for DCS Graphics Window Layout.***

1. Graphics

Graphics Area Display shows the customized graphic area located in the main window. This customized graphic area contains schematic representation of Plant's Piping and Instrumentation with associated dynamic data. The graphics display resolution is 1920 x 1076 using 24 inches LCD.

2. Graphics Title

Graphics Title of the graphical display is defined with Capital Characters. It is placed at the top of every graphic display.


3. Faceplate

The Faceplate is an operator accessible graphics-panel that appears whenever called on, usually by a Target Button is defined in all process values, controllers/indicators symbols and equipment motor symbols for calling this faceplate.

4. Display Control Buttons


The Display Control Buttons consists of the following:

- 1) "Silence" Button – this button usually keeps the sound of the alarm in silence
- 2) "Alarm" Summary Display Button – this display provides listing of maximum 200 process alarm messages. "Overflow" indication is provided when more than 200 process alarm messages are gathered. Newly generated alarms can be acknowledged on the display page by page basis or by message basis.
- 3) "System Status" Display Button – this display provides the running status of Harmonas-Deo Open Supervisory Station (DOSS). Not only monitoring of Harmonas-Deo DOSS but also acknowledges actions to the system alarms, startup of Harmonas-Deo Controllers can be accomplished through the display. System Status Display can be called by clicking <SYS STAS> button on Tool Bar.
- 4) "Message" Summary Display Button – this display provides the listing of 200 messages. Message is a tool for operators to converse with CL sequence programs by Acknowledge operation and Confirm operation. CL sequence generates message to inform operators of process status or to send operator guidance etc. so that operators can view the messages on the Message Summary Display to take action or to make decision
- 5) "Sequence Event" Summary Display Button – provides listing of 200 Sequence Event Messages. Sequence Event occurs in the following situation:

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- (1) CL program stops and therefore cannot proceed to the next process due to some reason while CL program is running
 - (2) CL detect process critical situation and initiate abnormal sequences. "Overflow" indication is provided when more 200 Sequence Events are generated. Newly generated events can be acknowledge on the display page by page basis by vent basis
- 6) "Previous" and "Next" Button – in DOSS, total of 10 displays are memorized in the memory and the previous selected display within display control buttons can be called using "PREVIOUS" button likewise the next selected display can be called using the "NEXT" buttons. The criteria are same as Explorer. When previous displays or next displays are not available, the buttons are not indicated.
 - 7) "Graphic" Display Button – all graphic display can be called up using this button. Graphic display is custom - made display wherein plant schematics are drawn such as Piping and Instrumentation with associated process dynamic data. Graphic display is a custom – made not only for indication but also customized data entry or conversational scenario can be implemented. Maximum of 400 graphic displays can be implemented per DOSS.
 - 8) "Group" Display Button – Group Display is one of the standard displays on DOSS providing maximum 8 faceplates on a LCD screen. Faceplate is designed to simulate conventional control instruments maximum extent. You can assign points freely on any Group Display. Once point is assigned, DOSS automatically provides associated faceplate with the point type. Each point type has a corresponding Faceplate.
 - 9) "Trend" Display Button – Trend display provides maximum 8-trend pens indication of historical data on a LCD screen. Time span, display range etc can be manipulated on the trend display to focus on particular plant dynamics.
 - 10) "Detail" Display Button – Detail Display provides faceplate information, that is equivalent to the Group Display, and detailed configuration and setting parameters associated with the Point name. Through the Detail Display, the following change operation can be made:
 - (1) PID tuning parameters
 - (2) Alarm trip point
 - (3) Point Active/Inactive
 - (4) Point configuration and Others

Note: Changing of parameters in DCS Detail Screen is prohibited. Permission from Shift Foreman is necessary for this operation.
 - 11) "System Configuration" Button – System Configuration/Command Menu Display provides a tool to change system-wide parameters that need to be change at on line concurrently with normal plant operation and to shutdown Harmonas-Deo system safely to prevent form data-base corruption etc.
 - 12) Report Menu or "Sub Menu" Display Button – DOSS provides MS-Excel based report capability. Each report can be automatically generated/printed, manually generated/printed or manually archived on DOSS Hard Disk for later playback. The manual operation can be executed through the Report Menu Display but not included in this project.


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- 13) "Print" Button – this button is used to initiate printing on the connected printer and it can be suppressed to prevent nuisance of screen print. It is recommended to request the print screen function on sheet by sheet basis confirming that the previous print is completed. The print screen function prints the currently opened display.
- 14) Security Access Level – the Control System is provided with user access levels that will allow different categories of users to modify different types of information. Each user will have a unique login and be assigned with specific privileges.
 - (1) Operator – restricted to basic screen navigation and monitoring, plant operation and control, and parameter adjustment related to quality or production
 - (2) Supervisor – allows the same access as the operator with the additional viewing the engineering parameters and supervisory functions. Also allowed to change values in the details screen for ranges of the control parameter.
 - (3) Engineer – this level gives the full access to all system which includes and not limited to changes of the program, by pass of interlocks and modifying tuning parameters

III. Definition of Terms

1. Workstation – refers to the equipment used to monitor and control the operating parameters and field equipment to maintain a holistic operation. It consists of a monitor, keyboard and central processing unit (CPU). The workstation is also called the DOSS.
2. Equipment Operation Mode – refers to the position of equipment and describes how the equipment could be operated, could be Remote or Local, Manual, Auto or Cascade mode.
3. Remote Mode – the equipment is START and STOP function is controlled by the Distributed Control System (DCS) and cannot be operated in the field operator. Control for the equipment operating speed is also manipulated by DCS. Additionally, equipment interlocks through the DCS are active.
4. Local Mode - the equipment START and STOP function is only accessible by the Local Control Switch (LCS) installed in near the equipment. The equipment DCS interlock is not active during Local mode operation. However, the controller function of DCS is still accessible and DCS operator can adjust the operating speed of the equipment during normal operation.
5. Manual Mode – the operation of controller or equipment/control valve are controlled by the DCS operator. In the graphics display, M appears on the instrument, controller or equipment when it is in Manual mode.
 - 1) Controller in Manual Mode
The controller operation is not affected by the Set Point (SP). The operation is manually done by the DCS operator by manipulating the controllers Output (OP).
 - 2) Equipment and Control Valve in Manual Mode

The equipment or control valve is independent and not controlled by the designated controller. The operation of the equipment or control valve is manually done by the DCS operator by manipulating directly the equipment or control valve OP.

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6. Auto Mode – the operation of instrument/controller or equipment/control valve are automatically controlled by the DCS. In the graphics display, A appears on the instrument, controller or equipment when it is in Auto mode.

1) Controller in Auto Mode

The controller operation is automatically controlled by the DCS through the SP value. The controller's OP is automatically adjusted in order for the Present Value (PV) to reach the SP.

2) Equipment and Control Valve in Auto Mode

The equipment or control valve is independent and not controlled by the designated controller. However the equipment or control valve SP can be manually adjusted in order for the OP to change.

7. Cascade Control – the operation of instrument/controller or equipment/control valve (slave) are automatically controlled by another controller (master controller) in the DCS. In the graphics display, C appears on the instrument, controller or equipment when it is in Cascade mode.

1) Controller in Cascade Control

The SP setting of the controller (slave) is automatically controlled by another DCS controller (master controller) in order for the latter's PV to reach the SP.

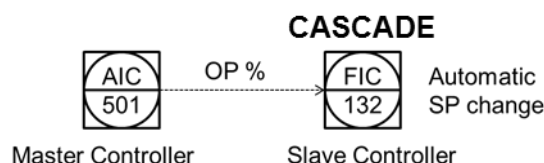


Figure 3-1: Controllers in Cascade Control

2) Equipment and Control Valve in Cascade Control

The equipment or control valve OP is automatically controlled by the designated controller in order for the latter's PV to reach the SP.

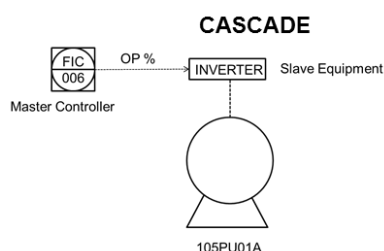


Figure 3-2: Controller - Equipment in Cascade Control

8. Interlock – it is an automatic response or action of equipment or components when certain parameters such tank level, temperature or pressure become out of the normal range. Interlocks are installed for safety of personnel and prevent damage of equipment and property. Equipment interlocks are only active when the equipment is placed into Remote or

override switch in Auto Mode except for pull cord and gate switch functions in the conveyor system.

Interlock is programmed into the DOSS to avoid unexpected accident and ensure process safety. On the other hand, "TRIP" is built-in to the equipment to prevent equipment damage specifically in the electrical circuit (equipment safety).

9. Override Switch – sometimes called AUTO/MAN switch. This switch is used to bypass an interlock and prevent equipment from stopping due to abnormal operating condition. These switches are only used during start-up and shutdown conditions and also during equipment or instrument maintenance.
10. Set point (SP) – refers to the required parameter value set to be maintained
11. Present Value (PV) – refers to the current process variable
12. Output (OP) – shown in percent (%), could be the ratio of running speed of the motor with VSD or the ratio of a control valve opening.

IV. Static Display

1. COLOR SCHEME DEFINITION

- 1) Process fluid color schemes that are used to define the graphic display

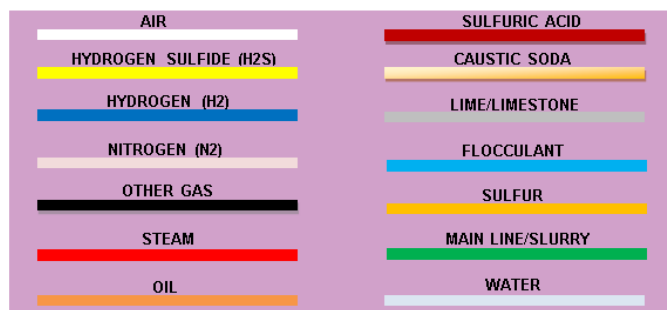


Figure 4-1: Process Fluid Color Scheme in DCS Graphics

- 2) Color scheme that are used to define the graphic display

Table 4-1: Graphic Display Color Scheme

No.	Description	Color
1	Title	Brown
2	Text/Symbol	White if background is dark color Black if background is light color
3	Process Fluid	Refer to Figure 4-1
4	Graphical Display Background	Standard Gray

2. Engineering Unit

The abbreviations of engineering units are shown in the table below are just example used in graphical displays.

Table 4-2: Engineering Units in DCS Graphics

Description		Engineering Unit	
		Shown in Point Detail	Shown in Graphics
Flow	Gas	Nm3/h	Nm3/h
	Liquid	m3/h	m3/h
	Solid	kg/h, t/h	kg/h, t/h
Temperature		deg C	°C
Level		% (mm)	% (mm)
Pressure	Gauge	MPag, kPag	MPag, kPag
	Absolute (PDI)	MPa, kPa	MPa, kPa
Weight		kg, t	kg, t
Analyzer		%, vol%	%, vol%
		ppm	ppm
		mS/m	mS/m
Speed		%	%
Time		sec, min, h	sec, min, h
Density		kg/m3	kg/m3
pH		pH	pH
Current		A	A
Rotation		rpm	rpm

V. Dynamic Display

1. Process Variables

All the process variables (PV) and (SV) in engineering unit will be displayed according to decimal format in point configuration with appropriate width. The frame of the Invisible Touch Target is defined to display in green color for the purpose of identifying the location of the selected process value whenever the target is activated and return to invisible once the FACEPLATE is cleared.

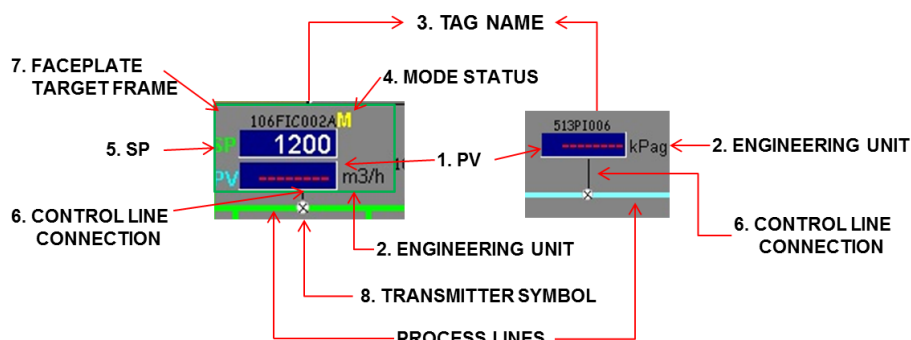


Figure 5-1: Process Variable Presentation in DCS Graphics


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Table 5-1: Summary of Process Variable Presentation in DCS Graphics

Item No.	Item	Character size	Process Value Condition	Color
1	Process Value (PV)	Arial – 11, Regular	i) Normal ii) Alarm	White Red
2	Engineering Unit (EU)	Arial – 11, Regular	Not applicable	Black
3	Tag Name	Comics Sans MS-6, Regular	Not applicable	Black
4	Mode Status	Arial Bold – 8	Not applicable	A (Auto) – CYAN M (Manual) - YELLOW C (Cascade) – CYAN
5	Set Point Value (SP)	Arial – 11 Regular	i) Normal	White
6	Control Line Connection	Not Applicable	Not Applicable	Black
7	Faceplate Target Frame	Not Applicable	Not Applicable	Green
8	Transmitter Symbol	Not Applicable	Not Applicable	Black White background

2. Control Valve

Refer to the figure below for the dynamic display of control valves in the DCS Graphics.

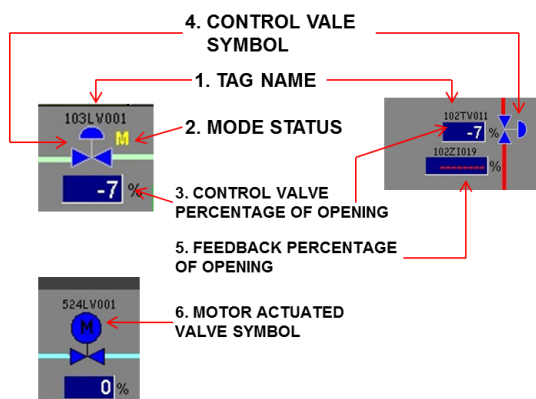



Figure 5-2: Control Valve Presentation in DCS Graphics

Table 5-2: Summary of Control Valve Presentation in DCS Graphics

Item	Description	Displayed Character	Character Size	Color
1	Tag Name	Text	Cosmic Sans MS-6	Black
2	Mode Status	M – Manual A – Auto C – Cascade	Arial-8 Bold	Manual – YELLOW Auto – CYAN Cascade – CYAN
3	Control Valve Percentage of Opening	Numeric	Arial -11, Regular	White

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Item	Description	Displayed Character	Character Size	Color
4	Control Valve Symbol	Not Applicable	Not Applicable	Full Open – Red -5% < OP < 105% shading From blue to Red Full Close – Blue
5	Feedback Percentage of Opening	Numeric	Arial-11, Regular	White
6	Motor Actuated Valve	Not Applicable	Not Applicable	Run – Red Stop - Blue

3. ON/OFF Valve

The symbol used for indication of discrete valve (on/off) is defined with its color changes based on the position of the valve. The discrete valve that is controllable via DCS is drawn hand switch symbol to which an invisible touch target is defined for the purpose of calling up its respective face plate.

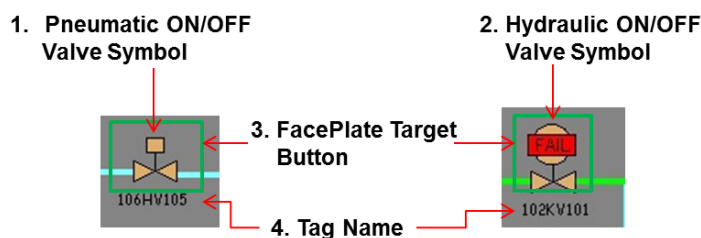


Figure 5-3: ON/OFF Presentation in DCS Graphics

Table 5-3: Summary of ON/OFF Valve Presentation in DCS Graphics

Item	Description	Valve's Position	Displayed Color
1	Pneumatic On/Off Valve Symbol	Opened Closed Abnormal/Command Disagree Travelling	Red Blue Blinking Orange Orange
2	Hydraulic On/Off Valve Symbol	Opened Closed Abnormal/Command Disagree Travelling	Red Blue Blinking Orange Alarm signal = FAIL appear (refer to Section V – item 6) Orange
3	Faceplate Target Button	Not Applicable	Frame color remains Green when selected
4	Tag Name	Not Applicable	Cosmic Sans MS-6 Black

4. Rotating Equipment

1) Pumps and Blowers Presentation

Refer to the figure below for the presentation of rotating equipment in the DCS Graphics.

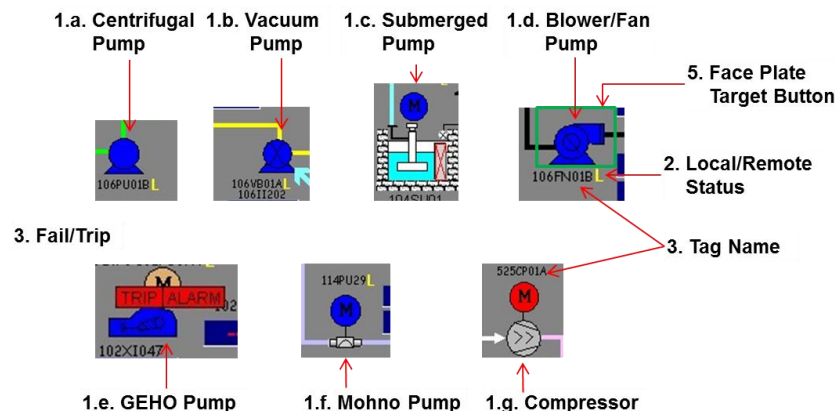


Figure 5-4: Rotating Equipment Presentation in DCS Graphics

Table 5-4: Summary of Rotating Equipment Presentation in DCS Graphics

Item	Description	Status	Displayed Color
1	a. Centrifugal Pump b. Vacuum Pump c. Submerged Pump d. Blowers and Fans e. GEHO Pump f. Mohno Pump g. Compressor	RUN STOP COMMAND DISAGREE	RED BLUE Blinking ORANGE
2	Local/ Remote Status	R – Remote L – Local	Arial-8, Bold – CYAN Arial-8, Bold – YELLOW
3	Tag Name	Not Applicable	Cosmic Sans MS-6, Regular BLACK
4	Fail/Trip Symbol	Trip	Blinking RED
5	Faceplate Button	Not Applicable	GREEN

2) Motor Status

Refer to the figure below for the presentation of motor status in the DCS Graphics.

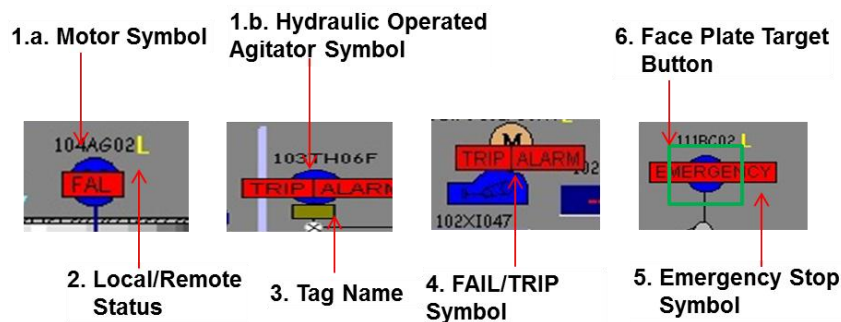


Figure 5-5: Motor Status Presentation in DCS Graphics

Table 5-5: Summary of Motor Status Presentation in DCS Graphics

Item	Description	Status	Displayed Color
1	Motor Symbol Hydraulic Operated Agitator Symbol	RUN STOP COMMAND DISAGREE FORWARD	RED BLUE ORANGE, Blinking RED
2	Local / Remote Status	R – Remote L – Local	Arial-8,bold CYAN Arial-8,bold YELLOW
3	TAG Name	Not Applicable	Cosmic Sans MS-6, Regular BLACK
4	Fail / Trip Symbol	TRIP	Blinking RED
5	Emergency Stop Symbol	EMERGENCY	Blinking RED
6	Faceplate Target Button	Not Applicable	GREEN

5. Level Indication

Level indication of tank or vessel is displayed by means of a dynamic indication bar placed within the equipment. Normally the indication bar is displayed in light cyan color but whenever there is an alarm condition occurs (preset alarm values in the level instrument); it changes to red color.

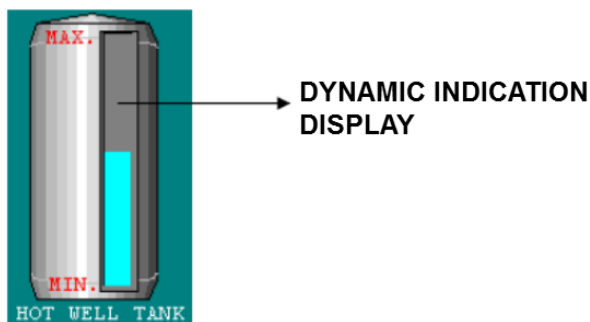


Figure 5-6: Level Indication Presentation in DCS Graphics

Table 5-6: Summary of Level Indication Presentation in DCS Graphics

Item	Description	Status	Displayed Color
1	Rectangular Line	Not Applicable	GRAY
2	Tank Level Indication Bar	Normal Alarm for Level LAHH, LAH, LALL, LAL	Light CYAN RED

6. Alarm Indication

Table 5-7: Summary of Alarm Display from Field Switches (e.g. LA,PA, etc.)

Item	Alarm Condition	Alarm Indication Symbol Behavior
1	Normal	INVISIBLE
2	Unacknowledged	Arial-7, Regular Blinking RED

1) Alarm Indication for High High and Low Low Switch

This type of alarm indication appears when the measured value reaches the high high or low low limit switch.

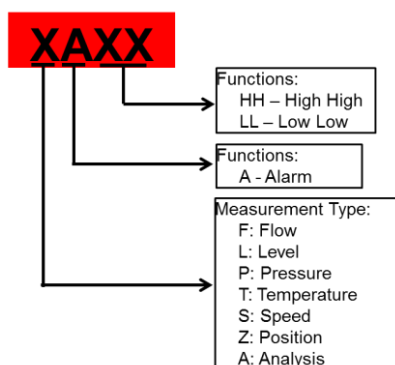


Figure 5-7: Alarm Indication High High and Low Low Switch Presentation

2) Alarm Indication for High and Low Switch

This type of alarm indication appears when the measured value reaches the high or low limit switch.

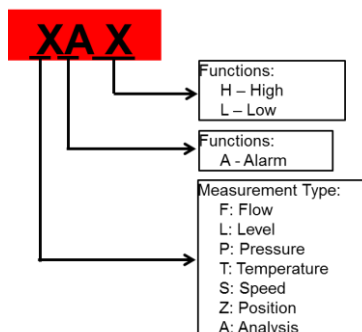


Figure 5-8: Alarm Indication High and Low Switch Presentation

3) Alarm Indication for Other Types of Alarm (Non-Measured Values)

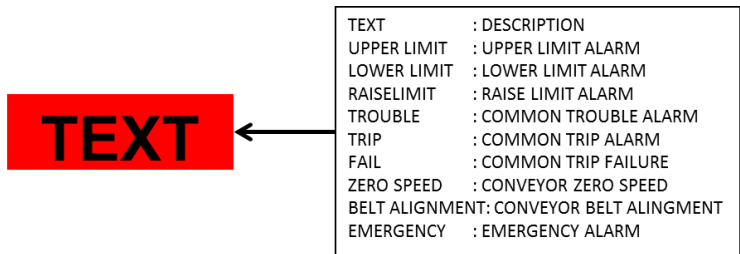


Figure 5-9: Other Alarm Indication Presentation

7. Selector Switch Indication

Selector switches are provided for equipment and instruments that have at least two possible DCS inputs or two possible DCS outputs. Selector switch is used in order for the instrument to identify which input or output is required in the operation. Refer to specific DSC Manual for discussion of DCS selector switches.

When selector switch is used, the one being selected by the DCS operator will be highlighted yellow in the DCS graphic screen. Refer to figures below.

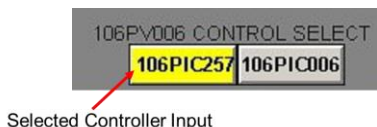


Figure 5-10: Controller Selector with Two Possible Instrument Input

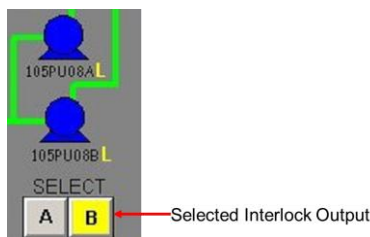



Figure 5-11: Interlock Selector with Two Possible Outputs

8. Auto-Select Switches/Sequence

Auto-select switches are installed to selectable pumps with designated controllers. These auto-select switches are operated by auto-select sequence which does not require additional selector switch graphics A/B in the DCS screen. Thus, no auto-select switch graphics is present in the DCS screen. The auto-select switches help the DCS operator in preventing mis-operations due to wrong selection in A/B selector switch button.

Pump auto select sequence shall handle selection for pump speed control. This sequence shall direct the PID controller to the final control element (pump inverter). It will also eliminate the need of selector switch on the graphic screen. Once the pump is started from pump

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faceplate, this sequence shall automatically commence directing the pump speed controller to the newly started pump.

The pump auto-select sequence is represented by figure 5-12. Once the pump A is started and running, the operation mode of pump A's speed controller will be automatically set to Cascade mode. On the other hand, when the pump B is started and running, the operation mode of pump B's speed controller will be automatically set to Cascade mode.

Pump Auto-Select Sequence

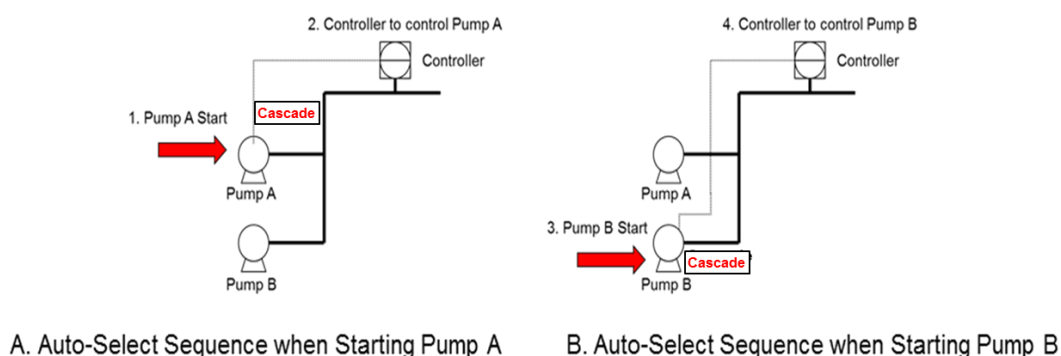


Figure 5-12: Pump Auto-Select Sequence Representation

Table 5-7: List of Auto-Select Switches

Item No.	Auto-Select Switch	Equipment	Equipment Description
1	102HS605	102PU08AB	Scrubber Seal Tank Discharge Pump
2	202HS605	202PU08AB	Scrubber Seal Tank Discharge Pump
3	103HS041	103PU12AB	CCD Feed Pump
4	103HS055	103PU13AB	NTRL Seed Pump No. 1
5	103HS056	103PU14AB	NTRL Seed Pump No. 2
6	103HS400	103PU04AB	CCD4 Underflow Pump
7	103HS500	103PU05AB	CCD5 Underflow Pump
8	103HS600	103PU06AB	CCD6 Underflow Pump
9	103HS700	103PU07AB	CCD7 Underflow Pump
10	103HS800	103PU08AB	CCD8 Underflow Pump
11	103HS900	103PU09AB	CCD9 Underflow Pump
12	104HS203	104PU02AB	NTRL Thickener Underflow Pump
13	106HS067	106PU05AB	MS Cyclone Feed Pump
14	106HS070	106PU04AB	MS Thickener Underflow Pump
15	106HS082	106PU01AB	MS Feed Pump No. 1
16	106HS213	106PU14AB	Barren Liquor CCD Feed Pump
17	114HS202	114PU61/62	MS Flocculant Feed Pump
18	114HS203	114PU41/42	NTRL Flocculant Feed Pump

9. Override Switch Indication

Override switches are used to bypass an interlock. This switch is represented by an AUTO/MAN switch. When selected to AUTO, the instrument or equipment interlock is active. When selected to MANUAL the instrument or equipment interlock is inactive. Refer to the figure 5-13.



Figure 5-13: Override or AUTO/MAN Switch Presentation in DCS Graphics

VI. Related Display

All lines going to or coming from another process graphic display are drawn with an arrow and a text indicating the name of the equipment to or whom which the line is connected.

For all arrows of the Process Lines, it will be drawn at the left or right most side of the graphic screen while arrows of the Utility Line (such as Water, Nitrogen, Steam and Caustic Soda) will be drawn away from either side of the graphic screen (close or middle of the graphics screen).

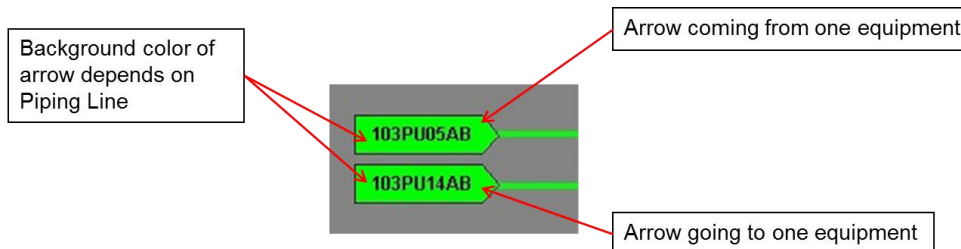


Figure 6-1: Process Arrows in DCS Graphics

VII. Specification of Faceplate

1. Outline of Faceplate

Faceplate allows the operator to change a subset of parameter, this subset depend on the view point type specified in target action. Faceplate is an overlay to update faster. A Faceplate appears in the right or left area of display when operator touched the target.

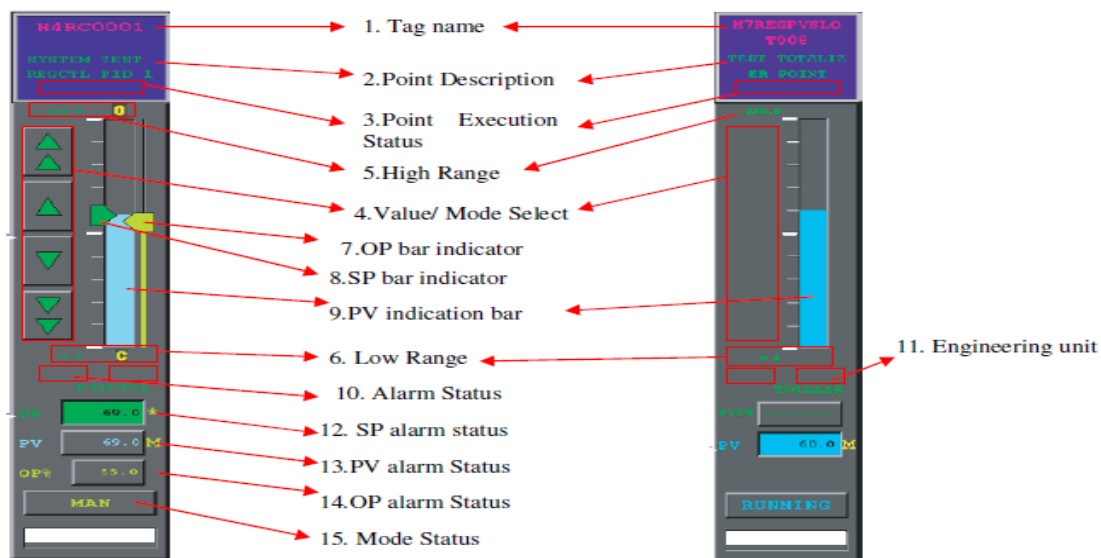


Figure 7-1: Faceplate Presentation in DCS Graphics

Table 7-1: Faceplate Presentation in DCS Graphics

Item	Description	Status/Indicator	Displayed Color
1	Tag Name	Not Applicable	RED
2	Point Description	Not Applicable	GREEN
3	Point Execution Status	(blank) – Active/Normal INACTIVE – Point Inactive INIT – Point is Initialized BYPASS – interlock Bypass On SHTDWN – Shutdown Flag On TIME UP – Time up for Timer RED TAG – Point is Red Tagged	
4	Value / Mode Select	RUNNING – Totalizer Running STOPPED – Totalizer Stopped RESET – Totalizer Reset MAN – Manual Mode Select AUTO – Auto Mode Select CAS – Cascade Mode Select Raise/Lower Key	
5	High Range/ Display OPEN/CLOSE for Output	(RRRR.R) Numeric C or O depends on Setting	GREEN YELLOW
6	Low Range/Display OPEN/CLOSE for Output	(RRRR.R) Numeric C or O depends on Setting	GREEN YELLOW
7	OP Bar Indicator	Not Applicable	DARK YELLOW
8	SP Bar Indicator	Not Applicable	DARK GREEN
9	PV Indicator	Not Applicable	CYAN

Item	Description	Status/Indicator	Displayed Color
10	Alarm Status	(blank) – No Alarm (normal) INH – Inhibit DIS – Disable *(yellow) – exceed overview limit ADV – Advisory SP BC – Bad Controller BP – Bad PV FB – Feed Back Command Disagree HD – High Deviation Alarm HI – High Alarm 2HI – High - High Alarm LD – Low Deviation Alarm LP – Low Alarm 2LP – Low - Low Alarm OFN – Off Normal RC + -- Rate Change Positive RC - -- Rate Change Negative UNC – Uncommanded Change Alarm	
11	Engineering Unit	(XXXX) depends on transmitter type	
12	SP Alarms	* - SP Windup High/Low H – SP Exceeded High Limit L – SP Exceeded Low Limit V - - Windup Low ^ -- Windup High B – Bad SP	
13	PV Alarms	B – Bad PV H – Bad PV and Over PV High Extended Range L – Bad PV Under PV Low Extended Range M – Bad PV and PVSOURCE “MANUAL” S – Bad PV and PVSOURCE “SUBSTITUTE” U – Uncertain PV H – Uncertain PV and over PVHEXTND range L – Uncertain PV and under PVLO EXTND range M – Uncertain and PVSOURCE “MANUAL” S – Uncertain PV and PVSOURCE “Substitute” (blank) - Normal	
14	OP Alarm Status	* - SP Windup High/Low H – SP Exceed SP High Limit L – SP Exceed Low Limit V – Wondup Low ^ - Windup High	

Item	Description	Status/Indicator	Displayed Color
15	MODE Status	MAN – Manual OP Control by Operator AUTO - OP calculated by alogarithm CAS – Cascade /OP SP is from Primary out BCAS – Backup Cascade OP/SP from Backup P-MAN – Program Manual P-AUTO – Program Auto P-CAS – Program Cascade P-BCAS – Program Backup Cascade ???? – Can not Access Mode ----- – Invalid Mode	

2. Faceplate Images

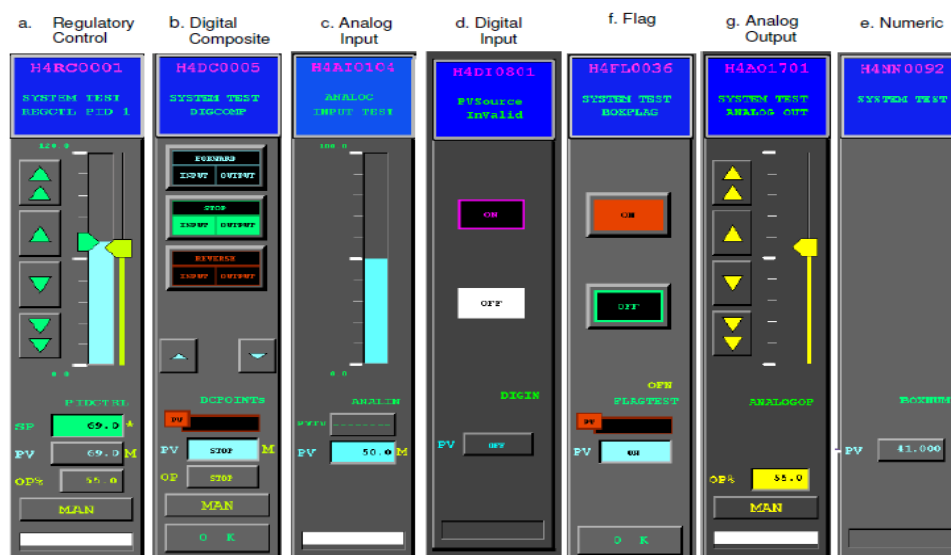


Figure 7-2: Example Faceplate Images in DCS Graphics


VIII. General Convention

1. Motors / Pumps Configuration

Current and inverter indication will be placed near the pump on the right side of the pump or on below of the pump without using connection line and only if applicable, run time counter is added.

The pumps will be represented individually in all graphics. Location of pumps will be decided as follows:

- 1) Pumps that are in suction part will be located at the left of the vessel
- 2) Pumps that are in discharge part will be located at the right side of the vessel
- 3) Pumps suction line shall be minimal or as short as possible

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- 4) Pumps arrangement in general shall be arranged in a horizontal manner as much as possible, however, the location of the indication shall also be arranged properly.

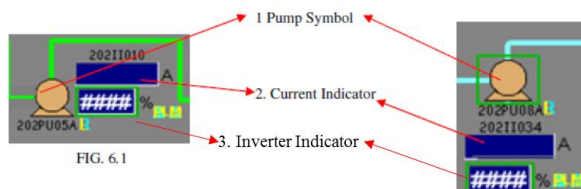


Figure 8-1: Current and Inverter Indication of Pumps/Motors in DCS Graphics

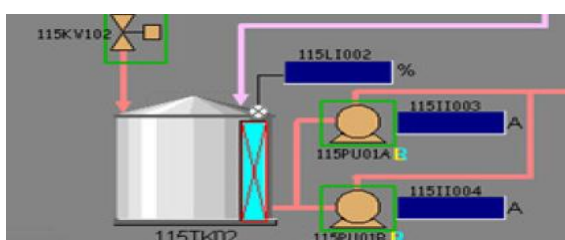


Figure 8-2: Pumps/Motors Configuration in DCS Graphics

2. Equipment Alignment

Equipment such as motors, pumps, tanks and other equipment are horizontally and vertically aligned in the DSC Graphic screen. Refer to the figure below.

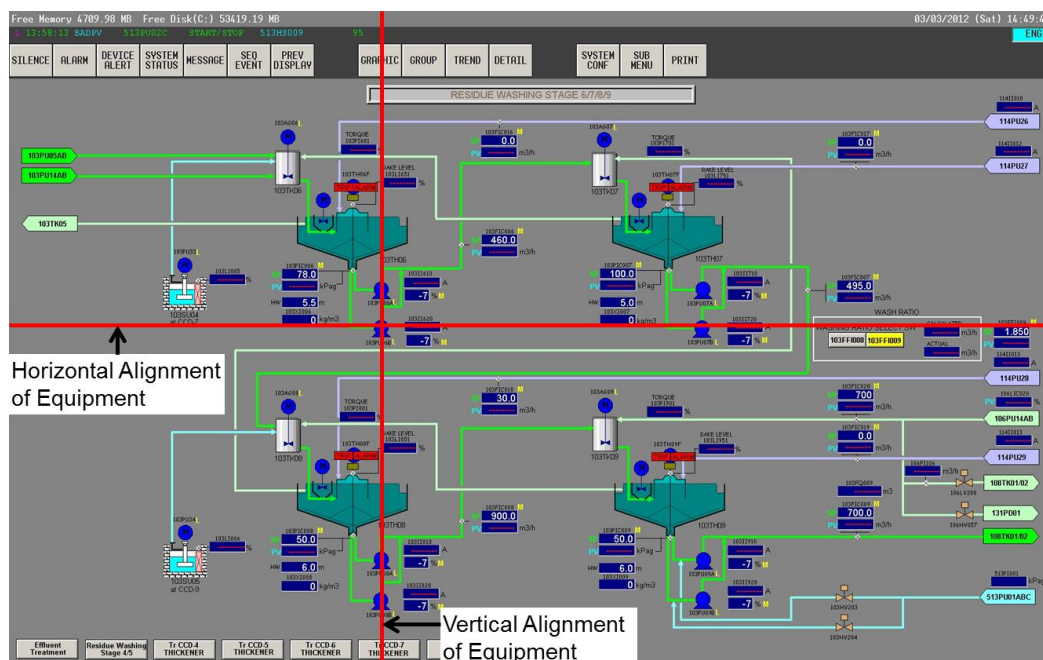


Figure 8-3: Horizontal and Vertical Alignment of Equipment in DCS Graphics

3. Sump Pump Configurations

The configuration of sump pump in DCS is shown on the figure below. The vent ducts connected to sump pumps are not presented in the DCS graphics.

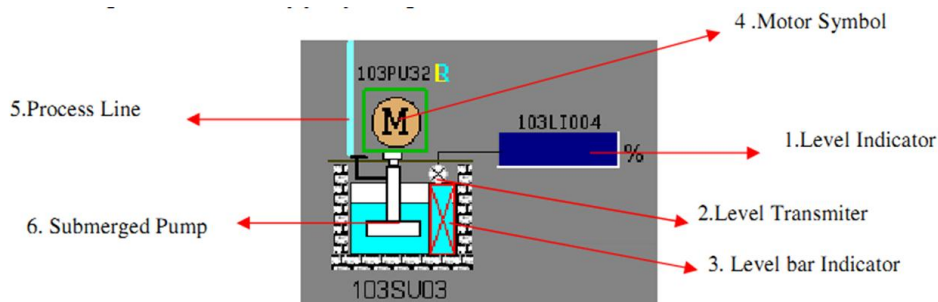


Figure 8-4: Sump Pump Indication in DCS Graphics

4. Tank or Vessel Level and Volume (if applicable) Indicator in DCS

In general, tank level indication shall be located on the right side of the tank or vessel; however, in case there is no enough space, level indicator shall be located properly. Refer to figure below for Level and Volume indicator in DCS Graphics.

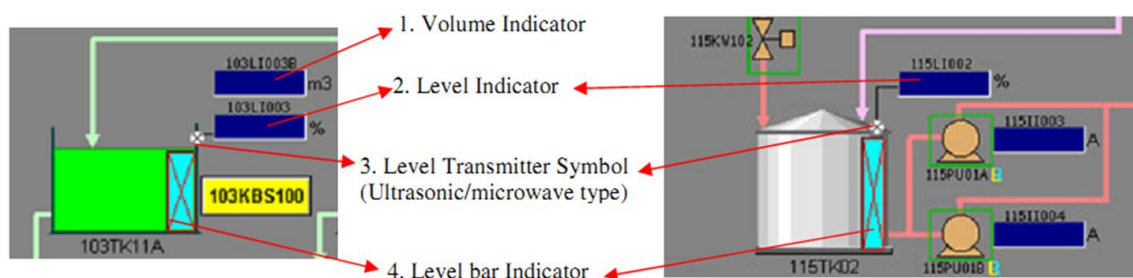


Figure 8-5: Level and Volume Indicator in DCS Graphics

5. Indicator Alignment

Indicators are horizontally and vertically aligned in the DSC Graphic screen. Refer to the figure below.

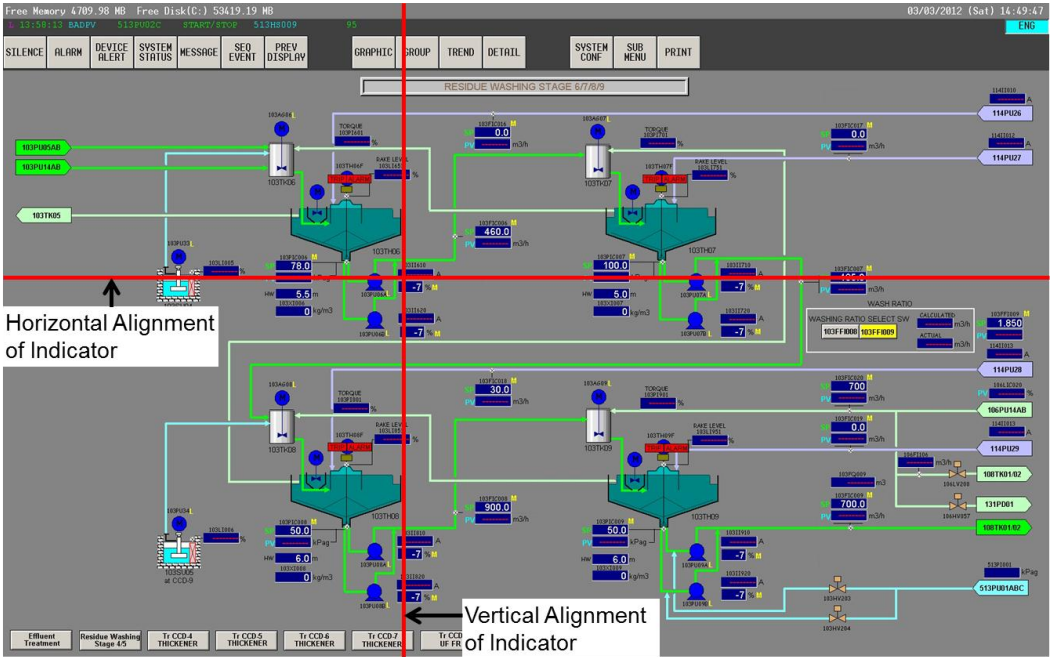


Figure 8-6: Horizontal and Vertical Alignment of Indicator in DCS Graphics

6. Equipment Tag

Equipment Tag shall be located at the bottom of the equipment however, in case there is no enough space, equipment tags shall be located properly. Refer to figure below.

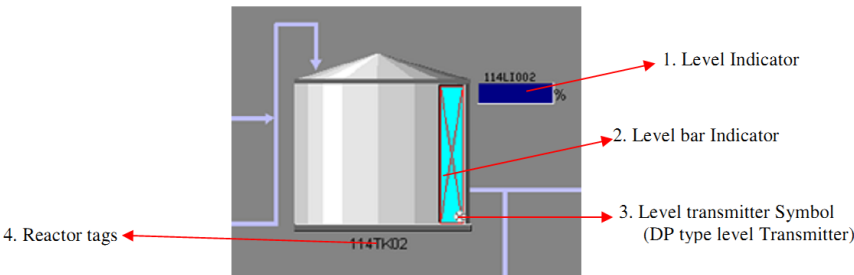


Figure 8-7: Equipment Tags Indication in DCS Graphics

7. Manual Valve

Manual valves with corresponding positioner limit switch are used in very critical manual valves (e.g. 106ZB120 used for 106TK14 seal pot isolation valve). These valves have special indication based on the status of the manual valves in the field. Refer to the figure below for the valve indication in DCS.

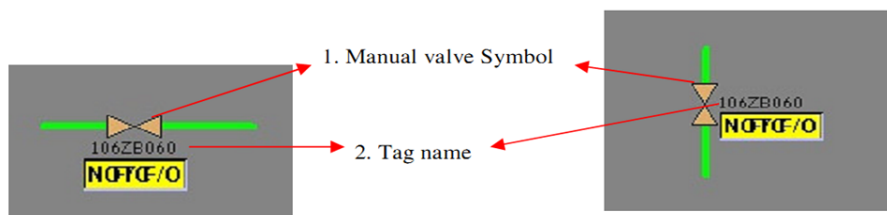


Figure 8-8: Manual Valve Indication in DCS Graphics

Table 8-1: Manual Valve Indication in DCS Graphics

Item	Description	Valve's Position	Displayed Color
1	Manual Valve	Fully Open Fully Close	RED BLUE
2	Tag No.	Not Applicable	Cosmic San MS-6 Regular BLACK
3	Manual Valve Position	Not Fully Opened Not Fully Closed	Blinking ORANGE

ANNEX 1: DCS Graphics Window Layout

