
 Taganito HPAL Nickel Corporation	<b>H1, H0, L0, L1, HHH, LLL SETPOINT DCS Manual</b>				
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## I. General Description

The H1, H0, L0, L1, HHH, LLL Set Point DCS Graphics is a common screen for Process A and B which shows a tabulation of critical set points (H1, H0, L0, L1, HHH, LLL) of instruments in the Plant. This graphics screen provides operator access on changing the instrument set points based on operation requirements because each instrument's DETAIL parameter doesn't have them. The critical points inputted must be within normal operating range to ensure safe and efficient process.

This graphic screen shows four (4) tables of instrument set points. The first table contains instruments having set point values from H1, H0, L0 and L1 for level indicator (LI), level indicator controller (LIC) and pressure indicator (PI). The second table contains level indicators for sump and sump pump operation. The third table contains instrument having LLL set point. Lastly, the fourth table contains instruments having HHH set point. Refer to **Annex 1** for H1, H0, L0, L1 SETPOINT Graphics.

H1, H0, L0, L1 set points are usually used in LI and LIC to initiate pump start and stop, or valve open/close status. It is also used in PI of strainers to determine if it is already blinded/clogged (PI value  $\geq$  H0) and if the strainer is damaged (PI  $\leq$  L0).

HHH and LLL set points for H2S Plant area (109/209) are also present in this screen. These set points are provided in order to activate the corresponding interlocks for equipment protection during abnormal conditions (when the HH and LL interlock does not work). For instance in Dirty Sulfur Tank (109TK02) if the level reaches the LLL set point of 20 %, then the Sulfur Filter Operational Sequence will automatically change the direction of the filtered sulfur back to the Dirty Sulfur tank and stop the forward to Clean Sulfur tank, 109TK03. (For HHH and LLL detailed discussion refer to **TNH-209-103 H2S DCS Manual**).

Additionally, H and L set points are the high and low level alarm set points of the tank. Once the Present Value (PV) reaches H or L set points, DCS alarm will be activated at the control room. This DCS alarm is used to alert the DCS operator of the upset condition.

*Table 1-1: Difference Between Instrument Set Points*

Set Points	Function
H, L	Alarm Function in DCS
H1, H0, L0, L1	Interlock Action (within normal condition)
HHH, LLL	Interlock Action (abnormal condition)

Also included in this screen is the link button for Graphics Overview which provides faster access to other process/sequence screens.

## II. Important Monitoring Items


None

## III. Interlocks/Controls

None

## IV. Control Sequences

None

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**V. Alarms**

None

**VI. DCS Emergency Shutdown**

None

**VII. Trend Graphs Grouping**

None

## Annex 1: H1, H0, L0, L1, HHH, LLL SETPOINT DCS Graphics

Free Memory 4902.07 MB Free Disk(C:) 53386.73 MB

13:58:13 BADPV 513PU02C START/STOP 513HS009 95

03/03/2012 (Sat) 15:46:10

ENG

SILENCE

ALARM

DEVICE ALERT

SYSTEM STATUS

MESSAGE

SEQ EVENT

PREV DISPLAY

GRAPHIC

GROUP

TREND

DETAIL

SYSTEM CONF

SUB MENU

PRINT

Table 1

H1, H0, L0, L1, SETPOINT

Graphics Overview

Table 2

Area	Tag Number	Equipment	H1	H0	L0	L1	Unit		
102/202	102LIC012	102TK03		61.2	32.8		%		
	102LIC03	102TK07		63.8	28.1		%		
	102PID06	102FT12AB		7000.0	6000.0		kPag		
	102PID03	102BS01		43.0	5.0		kPag		
	202LIC012	202TK03		61.2	32.8		%		
	202LIC03	202TK07		63.8	28.1		%		
	202PID06	202FT12AB		7000.0	6000.0		kPag		
	202PID03	202BS01		43.0	5.0		kPag		
	103/203	103LIC002	103TK10	79.4	73.1	54.1	47.7	%	
	103LIC007	103TK12		50.0	45.0		%		
103/203	103LIC007	103TK12		50.0	45.0		%		
	103LIC008	103TK13		90.4	84.3		%		
	103LIC009	103TK14		55.0	50.5		%		
	105	105LIC003	105TK05	0.0	70.3	66.5	0.0	%	
105	105LIC005	105TK08		92.0	54.7	46.6	19.4	%	
	105LIC004	105TK13		92.0	52.9	45.1	18.7	%	
	106	106LIC011	106TK04		92.0	73.0	64.8	31.2	%
	106LIC013	106TK05		85.0	61.4	48.3	30.0	%	
	106LIC017	106TK08			91.4	20.1		%	
	106LIC020	106TK14			86.8	30.2		%	
	106LIC021	106TK15			75.0	25.0		%	
	106LIC026	106TK18		95.0	92.9	23.8	20.0	%	
	106LIC021	106TK20		90.7	69.8	38.4	17.6	%	
	106LIC007	106VE05			12.7			%	
109/209	109TI018	109TK01		145.0	135.0		°C		
	109LIC021	109TK03		62.2	53.6		%		
	109LIC020	109TK04		75.0	53.6		%		
	109LIC013	109TK07		89.6	20.8		%		
	109LIC015	109TK15		78.5	28.5		%		
	109LIC002	109VE03		76.5	25.5		%		
	209LIC002	209VE03		76.5	25.5		%		
	109LIC008	109VE11		73.0	58.0		%		
	111	111LIC001	111TK02		70.0	70.0		%	
	114	114LIC001	114TK01		77.0	10.0		%	
114LIC002		114TK02		75.0	50.0		%		
115		115LIC001	115TK01		70.0		%		
115LIC002	115TK02		75.0			%			
524	524LIC007	524PU03		60.0	40.0		%		

Area	Tag Number	Equipment	LLL			Unit
109/209	109LIC024	109TK02	20.0			°C

Area	Tag Number	Equipment	HHH			Unit
109/209	109TI206	109HX11B	80.0			°C
	109TI207	109HX11AB	80.0			°C
	109PID211	209HX11A	70.0			kPa
	209TI206	209HX11B	80.0			°C
	209TI207	209HX11AB	150.0			°C
	209PID211	109HX11A	0.0			kPa

Area	Tag Number	Equipment	H1	H0	L0	L1	Unit
101/201	101LIC02	101SU01(101PU10)		85.0	35.0		%
	101LIC03	101SU1(101PU11)		85.0	35.0		%
	101LIC04	101PD01(101PU00/41)		85.0	35.0		%
	101LIC04	101SU12(101PU12)		80.0	12.9		%
	201LIC04	201SU12(201PU12)		97.2	12.9		%
	102/202	102LIC06	102SU02(102PU21)		70.0	30.0	%
	102LIC09	102SU03(102PU22)		0.0	0.0		%
	102LIC13	102SU04(102PU23)		85.0	30.0		%
	202LIC06	202SU02(202PU21)		95.9	21.9		%
	202LIC09	202SU03(202PU22)		0.0	0.0		%
103	202LIC13	202SU04(202PU23)		96.7	32.3		%
	103LIC03	103SU01(103PU00)		47.5	29.3		%
	103LIC04	103SU03(103PU02)		48.7	28.7		%
	103LIC05	103SU04(103PU03)		48.7	28.7		%
	103LIC06	103SU05(103PU04)		48.7	28.7		%
	103LIC09	103SU06(103PU05)		69.4	21.6		%
	104	104LIC03	104SU01(104PU10)		43.2	28.7	%
	105	105LIC07	105SU01(105PU11)		90.0	40.0	%
	105LIC08	105SU02(105PU12)		90.0	40.0	%	
	106	106LIC02	106SU01(106PU12)		94.6	43.2	%
106LIC02	106SU03(106PU23)		80.0	0.4	%		
106LIC018	106SU04(106PU24)		59.2	28.8	%		
106LIC022	106SU05(106PU25)		59.5	28.7	%		
106LIC009	106SU07(106PU37)		90.0	10.0	%		
106LIC022	106SU08		90.7	69.8	38.4	17.6	%
108	108LIC05	108SU01(108PU11)		90.0	35.0	%	
109	109LIC135	109SU032(109PU32)		66.7	25.0	%	
	109LIC06	109SU033(109PU33)		66.7	25.0	%	
	109LIC05	109SU034(109PU34)		66.7	25.0	%	
	109LIC07	109SU042(109PU42)		66.7	25.0	%	
	421LIC09	421SU036(421PU36)		66.7	25.0	%	
	111	111LIC02	111SU01(111PU04)		80.0	10.0	%
111LIC010	111SU04(111PU07)		80.0	10.0	%		
114	114LIC005	114SU01(114PU21)		59.2	28.8	%	
115	115LIC003	115SU01(115PU03)		80.0	35.0	%	
416	416LIC002	416SU010(416PU10)		80.0	0.0	%	

Area	Tag Number	Equipment	HHH			Unit
109/209	109TI206	109HX11B	80.0			°C
	109TI207	109HX11AB	80.0			°C
	109PID211	209HX11A	70.0			kPa
	209TI206	209HX11B	80.0			°C
	209TI207	209HX11AB	150.0			°C
	209PID211	109HX11A	0.0			kPa

Table 3

Table 4