Taganito HPAL Nickel Corporation	ESD AND H2S MAINTENANCE BYPASS SWITCH DCS Manual				
	Document Title				
	Department	Production	Revision No.	Document No.	Page
	Section	Process AB	**01**	**TNH-200-103 (10)**	**1 of 11**
	Area	Common			

HISTORY of REVISION

Rev. No.	Effective Date	Revised Page (s)	Description	Prepared by	Checked by	Noted by	Approved by
01			New	GJHO	DJN/HM	ON	FM

Prepared by	**Checked by**	**Noted by**	**Approved by**
Grezil Joie H. Ortega	Dexter J. Navales Hiroyuki Mitsui	Osamu Nakai	Fumio Mizuno
Date:	Date:	Date:	Date:

IMPORTANT:
THIS COVER SHEET FORM IS PART OF THE FOLLOWING DOC SHEETS AND IS NOT TO BE DISCARDED UNLESS SUPERCEDE BY A REVISED ISSUE.

CONTENTS

I. General Description

ESD and SIS are very important safety system of THPAL plant that provides emergency shutdown of HPAL 102/202, MS Plant and H2S Plant when hazardous condition in the process area is occurring. The ESD and SIS are triggered by process alarms (instrument/equipment alarms), manual pushbutton or Electric Power Failure. Refer to ***TNH-200-102 Emergency Shutdown (ESD) Manual*** for detailed discussion of ESD and SIS.

Each process alarm linked to ESD and SIS has designated maintenance bypass switch. When these bypass switches are activated, the signal from the process alarms are cut off thus preventing activation of ESD or SIS by process alarm conditions. However, ESD and SIS manual pushbuttons and electric power failure signals are still active and ESD or SIS can still be activated when any of these two signals are triggered. Refer to Figure 1-1 for block diagram of the maintenance bypass function.

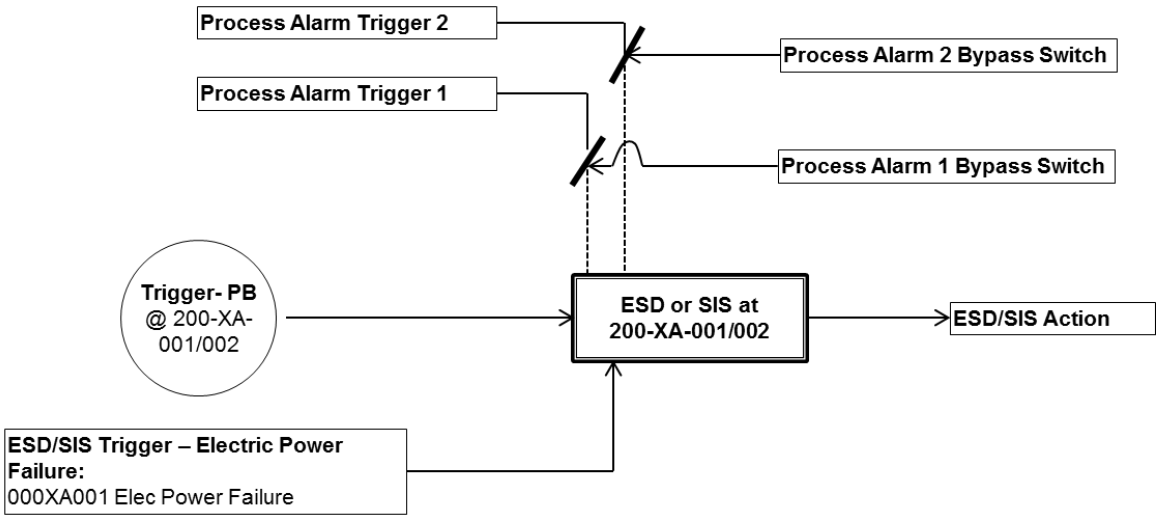


Figure 1-1: Maintenance Bypass Switch Block Diagram

The ESD Maintenance Bypass Switch Graphics provides operator access on the bypass switches of HPAL 102/202 and MS Plant ESD process alarms (refer to ***Annex 1***). On the other hand, the H2S Maintenance Bypass Switch Graphics provides bypass switches for H2S Plant SIS process alarms (refer to ***Annex 2***). Each bypass switch button in the DCS graphics has the name of the equipment and description of the instrument/process alarm.

During normal operation, these bypass switches must be deactivated in order to ensure safe operation of the Plant. Deactivated bypass switch buttons are colored light yellow. . In case of maintenance servicing or instrument's testing and calibration the specific button must be clicked by the DCS operator in order to activate the maintenance bypass switch and prevent activation ESD or SIS. Activated bypass switch are colored light brown in order to distinguish it from other switches.

II. Important Monitoring Items

1. Controllers' Description

None

2. Instruments' Description

None

3. Motors

None

4. Actuated Valves

None

5. Switches

1) ESD Maintenance Bypass Switches

Table 2-1: ESD Maintenance Bypass Switches

UZ Description	Process Alarm	Bypass Switch
102/202-UZ-600 – Autoclave Shutdown	102/202AC01 Level HH – 102/202-LA-028	102/202LS028BP
	102/202HX03 Press HH – 102/202-PA-006	102/202PS006BP
	102/202AC01 Press HH – 102/202-PA-010	102/202PS010BP
102/202-UZ-620 – Steam Shutdown	102/202VE04 Level HH – 102/202-LA-036	102/202LS036BP
	HP Steam Header Press HH – 102/202-PA-009	102/202PS009BP
102/202-UZ-660 – Acid Shutdown	102/202AC01 Comp.1A Acid Flow LL – 102/202-FA-007	102/202FS007BP
	102/202AC01 Comp.1B Acid Flow LL – 102/202-FA-039	102/202FS039BP
	102/202AC01 Comp.1A Acid Press LL – 102/202-PA-023	102/202PS023BP
	102/202AC01 Comp.1A Acid Press LL – 102/202-PA-037	102/202PS037BP
	102/202AG03A Stop – 102/202XA015	102/202XS015BP
	102/202AG03B Stop – 102/202XA016	102/202XS016BP
	102/202AC01 Comp.7 Level LL – 102/202-LA-029	102/202LS029BP
	102/202AC01 Comp.7 Level LL – 102/202-LA-029	102/202LS029BP
	416TK01 Level LL – 416-LA-001	416LS001BP
	416TK02 Level LL – 416-LA-002	416LS002BP
	416TK03 Level LL – 416-LA-003	416LS003BP

UZ Description	Process Alarm	Bypass Switch
102/202-UZ-680 – HP Air Shutdown	102/202AC01 HP Air Header Pressure HH - 102/202PA033A	102/202PS033ABP
	102/202AC01 HP Air Header LL Pressure - 102/202PA033B	102/202PS033BBP
	Autoclave Shutdown Logic - 102/202-UZ-600	
	HP Air Shutdown Push Button at 200-XA-001 - 102/202HS629	
	Electric Power Failure from PSP - 000XA001	
106-UZ-800 – MS Plant Shutdown	106VE02 Press HH – 106-PA-003	106PS003BP
	106VE02 Level HH – 106-LA-004	106LS004BP
	106VE01 Press HH – 106-PA-002	106PS002BP
	106VE01 Level HH – 106-LA-003	106LS003BP
	106VE03 Press HH – 106-PA-004	106PS004BP
	106VE03 Level HH – 106-LA-005	106LS005BP
	106VE04 Press HH – 106-PA-005	106PS005BP
	106VE04 Level HH – 106-LA-006	106LS006BP
	106CP01AB Press HH – 106-PA-009	106PS009BP
106-UZ-810 – H2S Vent Scrubber (106SR02) Shutdown	106SR02 Level LL – 106-LA-501	106LS501BP
	106SR02 O2 HH – 106-AA-002	106AS002BP
	106SR02 Press HH – 106-PA-018	106PS018BP
	106FN01A Stop – 106-XA-054	106XS054BP
	106FN01B Stop – 106-XA-055	106XS055BP
	106SR02 H2S HH – 106-AA-005A	106AS005ABP
	106SR02 H2S HH – 106-AA-005B	106AS005BBP
	106PU41A Stop – 106-XA-050	106XS050BP
	106PU41B Stop – 106-XA-051	106XS051BP
	106SR00 Level LL – 106-LA-510	106LS510BP
	106PU00A Stop – 106-XA-500	106XS500BP
	106PU00B Stop – 106-XA-300	106XS300BP

UZ Description	Process Alarm	Bypass Switch
106-UZ-820 – Scrubber (106SR03) Shutdown	106SR03 Level LL – 106-LT-601	106LT601BP
	106FN02A Stop – 106-XA-056	106XS056BP
	106FN02B Stop – 106-XA-057	106XS057BP
	106PU51A Stop – 106-XA-058	106XS058BP
	106PU41B Stop – 106-XA-059	106XS059BP
	106SR03 H2S HH – 106-AA-013A	106AS013ABP
	106SR03 H2S HH – 106-AA-013B	106AS013BBP
106-UZ-800 / 106-UZ-810 / 106-UZ-820 Common	Nitrogen Press LL – 525-PA-001	525PS001BP
	Instrument Air Press LL – 521-PA-002	521PS002BP

2) H2S (SIS) Maintenance Bypass Switches

Table 2-2: H2S (SIS) Maintenance Bypass Switches

SIS Description	Process Alarm	Bypass Switch
109SIF026 – Process Gas Scrubber (109SR01) High High Pressure	109SR01 Diff Press HH – 109-PDA-057	109PDT057BP
	109SR01 Inlet Press HH – 109-PA-110	1099PT110BP
109-UZ-450 – H2S Conc High High on Emergency Gas Scrubber (109SR02) Discharge	109SR02 H2S Content HH – 109-AA-085A	109AT085ABP
	109SR02 H2S Content HH – 109-AA-085B	109AT085BBP
109SIF059 - H2S Conc High High on Emergency Gas Scrubber (109SR02) Discharge	109SR02 H2S Content HH – 109-AA-083A	109AT083ABP
	109SR02 H2S Content HH – 109-AA-083B	109AT083BBP
	109SR02 H2S Content HH – 109-AA-083C	109AT083CBP
109SIF001 – Emergency Gas Scrubber (109SR02) Unavailable	109SR02 Upper Flow LL – 109-FA-076A	109FT076ABP
	109SR02 Lower Flow LL – 109-FA-076B	109FT076BBP
	109SR02 Level LL – 109-LA-089	109LT089BP
	109SR02 Diff Press HH – 109-PDA-074	109PDT074BP
	109SR02 Inlet Press HH – 109-PA-082	109PT082BP
109-UZ-460 – H2S Conc High High on Gas Leak Scrubber (109SR03) Discharge	109SR03 H2S Content HH – 109-AA-110A	109AT110ABP
	109SR03 H2S Content HH – 109-AA-110B	109AT110BBP

SIS Description	Process Alarm	Bypass Switch
109SIF060 - H2S Conc High High on Gas Leak Scrubber (109SR03) Discharge	109SR03 H2S Content HH – 109-AA-108A	109AT1083BP
	109SR03 H2S Content HH – 109-AA-108B	109AT108BBP
	109SR03 H2S Content HH – 109-AA-108C	109AT108CBP
109SIF003 – Gas Scrubber (109SR03) Unavailable	109SR03 Solution Flow LL – 109-FA-099	109FT099BP
	109SR03 Level LL – 109-LA-091	109LT091BP
	109SR03 Diff Press HH – 109-PDA-098	109PDT098BP
109-UZ-470 – Utilities Unavailable	109VE05 Inst. Air Press LL – 109-PA-146	109PT146BP
	421DR01A/B Hi Purity N2 Press LL – 109-PA-148	109PT148BP
	525NG02 Low Purity N2 Press LL – 109-PA-149	109PT149BP
	421VE12 H2 Press LL – 421-PA-026	421PT026BP
	Electric Power Failure – 000-XA-001	000XA001BP
109-UZ-430 – MS Plant Unavailable	MS Plant Interlock Signal – 109-XA-841B	109XA841BBP
109SIF153g – Area H2S Gas Detector High High Trip	109FT01A/B 2F H2S Content HH – 109-AA-115	109AT115BP
	109FT01A/B GF H2S Content HH – 109-AA-116	109AT116BP
	109VE01 H2S Content HH – 109-AA-212	109AT212BP
	109FT01A/B H2S Content HH – 109-AA-213	109AT213BP
	NE Corner Bound H2S Content HH – 109-AA-214	109AT214BP
	SE Corner Bound H2S Content HH – 109-AA-215	109AT215BP
	NW Corner Bound H2S Content HH – 109-AA-216	109AT216BP
	SW Corner Bound H2S Content HH – 109-AA-217	109AT217BP
	209VE01 H2S Content HH – 209-AA-212	209AT212BP
	209HX11A/B H2S Content HH – 209-AA-213	209AT213BP
109SIF102/209SIF202 – Hydrogen Feed to Reactor High High Pressure Trip	109/209VE01 Press HH – 109/209-PA-105	109/209PT105BP
	109/209VE01 Press HH – 109/209-PA-104	109/209PT104BP

SIS Description	Process Alarm	Bypass Switch
109/209-UZ-410 – Quench Column (109/209QC01) High High Differential Pressure	109/209QC01 Diff Press HH – 109/209-PDA-546A	109/209PDT546ABP
	109/209QC01 Diff Press HH – 109/209-PDA-546B	109/209PDT546BBP
109SIF105/209SIF205 – Quench Tower (109/209QC01) Gas Temperature High High Trip	109/209QC01Temperature HH – 109/209-TA-129B	109/209TT129BBP
109SIF111/209SIF211 – H2S Gas Cooler (109/209HX11AB) High High Pressure Trip	109/209QC01 Pressure HH – 109/209-PA-547	109/209PT547BP
	109/209HX11AB Pressure HH – 109/209-PA-210	109/209PT210BP
109SIF153a/209SIF253a – H2S Gas Cooler (109/209HX11AB) Room Gas Detector High High Trip	109/209ST12 H2S Content HH – 109/209-AA-601A	109/209AT601ABP
	109/209BW02 H2S Content HH – 109/209-AA-601B	109/209AT601BBP
	From 109/209BW02 to 109SR03 – 109/209-PALL-605	109/209PT605BP
109SIF153b/209SIF253b – Knockout Drum (109/209VE02) Room Gas Detector High High Trip	109/209ST13 H2S Content HH – 109/209-AA-602A	109/209AT602ABP
	109/209BW03 H2S Content HH – 109/209-AA-602B	109/209AT602BBP
	From 109/209BW03 to 109SR03 – 109-PALL-606	109/209PT606BP
109SIF153c/ 209SIF253c – Quench Column (109/209QC01) Room Gas Detector High High Trip	109/209ST11 H2S Content HH – 109/209-AA-620A	109/209AT620ABP
	109/209ST11 H2S Content HH – 109/209-AA-621	109/209AT621BP
	109/209ST11 H2S Content HH – 109/209-AA-622	109/209AT622BP
	109/209BW01AB H2S Content HH – 109/209-AA-620B	109/209AT620BBP
	From 109/209BW01AB to 109SR03 – 109-PALL-621	109/209PT621BP
109SIF153d/209SIF253d – Quench Column Flange Box Gas Detector High High Trip	109/209BW04AB H2S Content HH – 109/209-AA-615	109/209AT615BP
	109/209BW04AB H2S Content HH – 109/209-AA-616	109/209AT616BP
	From 109/209BW04AB to 109SR03 – 109-PALL-614	109/209PT614BP

SIS Description	Process Alarm	Bypass Switch
109SIF104/209SIF204 – Reactor Heater (109/209HX10) Unavailable	109/209VE01 Temperature HH – 109/209-TA-113	109/209TT113BP
	109/209VE01 Level LL – 109/209-LA-114	109/209LT114BP
	109/209HX10 T.B. Temperature HH – 109/209-TA-134	109/209TT134BP
	109/209HX10 Tube Temperature HH – 109/209-TA-133A	109/209TT133ABP
	109/209HX10 Tube Temperature HH – 109/209-TA-133B	109/209TT133BBP
	109/209HX10 Tube Temperature HH – 109/209-TA-133C	109/209TT133CBP
	109/209HX10 Tube Temperature HH – 109/209-TA-133D	109/209TT133DBP
	109/209HX10 Tube Temperature HH – 109/209-TA-133E	109/209TT133EBP
	109/209HX10 Tube Temperature HH – 109/209-TA-133F	109/209TT133FBP
	109/209HX10 Tube Temperature HH – 109/209-TA-133G	109/209TT133GBP
	109/209HX10 Tube Temperature HH – 109/209-TA-133H	109/209TT133HBP
	109/209HX10 Tube Temperature HH – 109/209-TA-133I	109/209TT133IBP

III. Interlocks/Controls

None

IV. Control Sequences

None

V. Alarms

None

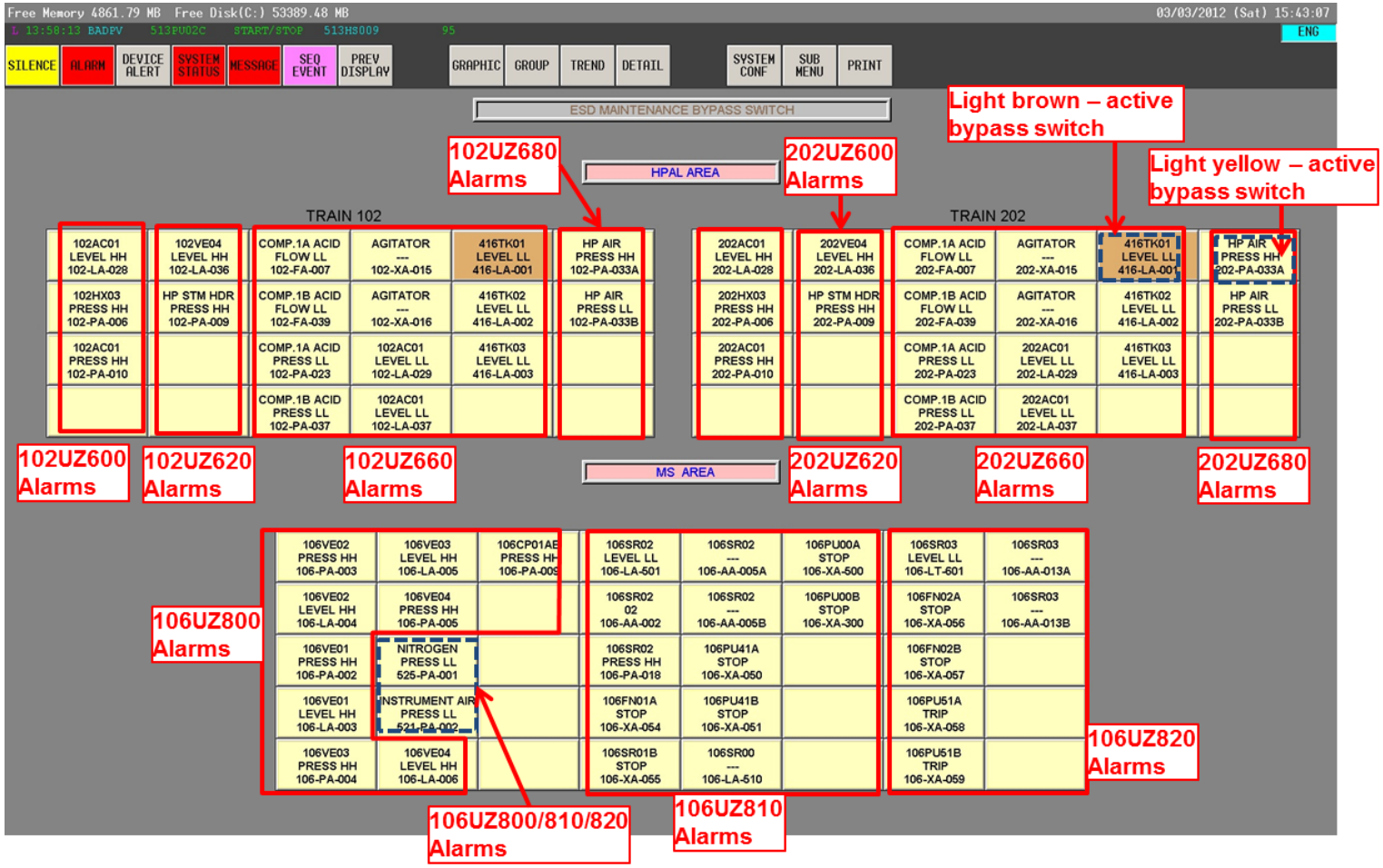
VI. DCS Emergency Shutdown

None

VII. Trend Graphs Grouping

None

Annex 1: ESD MAINTENANCE BYPASS SWITCH DCS Graphics



Annex 2: H2S MAINTENANCE BYPASS SWITCH DCS Graphics