Taganito HPAL Nickel Corporation	AUTO START from POWER FAILURE RECOVERY DCS Manual				
	Document Title				
	Department	Production	Revision No.	Document No.	Page
	Section	Process AB	**01**	**TNH-200-103 (5)**	**1 of 8**
	Area	Common			

HISTORY of REVISION

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

Prepared by	**Checked by**	**Noted by**	**Approved by**
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.
UNAUTHORIZED REPRODUCTION IS STRICTLY PROHIBITED.

CONTENTS

I. General Description

These graphics screens contain tabulation of critical motors that have AUTO START sequence after POWER RECOVERY. The tabulation of these critical motors includes Timer that describes the time delay for the motor to start after power has recovered. Refer to Annex 1 and 2 for the DCS Graphics Screens.

Operation Mode column is provided in the table in order for the DCS operator to identify if the equipment is in LOCAL or REMOTE mode. During normal condition, the equipment must be in remote mode thus the text indication for REMOTE is colored blue. On the other hand, the text indication for LOCAL is red in order to prompt the DCS operator of the abnormal condition and for the equipment to be set to REMOTE mode. LOCAL indication of the equipment in the DCS also appears when the equipment is de-energized in the MCC during maintenance activity on the equipment.

Status column in the table informs DCS operator the current operation status of the equipment. The text indication for RUN is colored blue while for STOP is red in order to distinguished one from the other. For the same type of equipment (e.g. 102PU08A and 102PU08B) at least one must be in operation/duty mode, therefore is the same equipment is in STOP mode, the DCS operator must immediately start one of the equipment.

These screens are provided with common acknowledge switch and common reset switch to acknowledge and reset alarms in the DCS room and in the field whenever abnormal operation condition occurs.

Link buttons (► and ◄) are present in these screens to shift from for AUTO START from POWER FAILURE RECOVERY Screen 1 to Screen 2 and vice versa. Shortcut link button to the Graphics Overview screen is also present in these screens.

II. Important Monitoring Items

1. Controllers' Description

None

2. Instruments' Description

None

3. Motors

None

4. Actuated Valves

None

5. Switches

1) 000HS901: DCS Common Acknowledge Switch

The common acknowledge (ACK) button (000HS901) is used by the DCS operator to acknowledge the alarm and silence the audible alarms/horns in the DCS room and in the field. However, the alarm beacon shall remain lighted until the alarm has been reset.

Figure 2-1: 000HS901 – Common Acknowledge Switch

2) 000HS902: DCS Common Reset Switch

The common reset (RESET) button (000HS902) is used by the DCS operator to reset all the alarms in the DCS. This switch will only function when the alarm value has been restored to normal.

Figure 2-2: 000HS902 – Common Reset Switch

III. Interlocks/Controls

None

IV. Control Sequences

Electric Power Failure occurs when the Steam Turbine Generator (STG or 711ST01) has failed and stopped producing electricity for the Plant's consumption. When 711ST01 operation stops, 000XA001 becomes an alarm and STOP I/L (interlock) will be applied to all running equipment through initiation of ESD, SIS, and DCS ESD sequence. Auto/Man (Override) switches will be forced to Manual during power failure except Auto/Man (Override) switches for critical motors with AUTO START sequence after power recovery.

After the 711ST01 has stopped, the seven (7) Diesel Emergency Generators (DEGs or 723GE01-07) automatically run to restore power to the plant. Once electric power has been restored to the Plant, the 000XA001 alarm will return to normal and it is considered as "Power Recovery". During this condition the STOP I/L will be released for all the equipment and the AUTO START sequence for the critical motors will be initiated.

Time Delay is set to avoid sudden and much power consumption, which may cause unexpected shutdown of the DEGs. For non-critical motors, the DCS operator can re-start the equipment after power recovery after an approval from PSU supervisor.

Table 2-1: Critical Motors with AUTO START Sequence after Power Recovery

Item No.	Equipment Tag	Time Delay (s)	Capacity (kW)	Remarks
1	102PU08A	0	13.2	Note 1
2	102PU08B	0	13.2	
3	102PU16A	0	11.1	Note 1
4	102PU16B	0	11.1	
5	202PU08A	0	13.2	Note 1
6	202PU08B	0	13.2	
7	202PU16A	0	11.1	Note 1
8	202PU16B	0	11.1	
9	513PU02A	0	90	Previously running 2 pumps will automatically run after Power Recovery.
10	513PU02B	0	90	
11	513PU02C	0	90	

Item No.	Equipment Tag	Time Delay (s)	Capacity (kW)	Remarks
12	106PU41A	0	27	Note 1
13	106PU41B	0	27	
14	106PU51A	0	13.2	Note 1
15	106PU51B	0	13.2	
16	106FN02A	0	18	Selected Fan will automatically run after Power Recovery.
17	106FN02B	0	18	
18	106PU00A	0	2.22	Note 1
19	106PU00B	0	2.22	
20	102PU13A	0	4.5	Note 1
21	102PU13B	0	4.5	
22	102PU14A	0	1.32	Note 1
23	102PU14B	0	1.32	
24	202PU13A	0	4.5	Note 1
25	202PU13B	0	4.5	
26	202PU14A	0	1.32	Note 1
27	202PU14B	0	1.32	
28	102PU15A	0	27	Note 1
29	102PU15B	0	27	
30	102PU15A-Aux	0	0.108	Note 1
31	102PU15B-Aux	0	0.24	
32	108PU21A	0	45	Note 1
33	108PU21B	0	45	
34	108PU21A-Aux	0	0.108	Note 1
35	108PU21B-Aux	0	0.24	
36	513PU03A	0	75	Note 1
37	513PU03B	0	75	
38	106VB01A-Aux	0	2.16	Note 1
39	106VB01B-Aux	0	2.16	
40	106CP01A-Aux	0	0.972	Note 1
41	106CP01B-Aux	0	0.972	
42	109BW01A	0	22	Note 1
43	109BW01B	0	22	
44	209BW01A	0	22	Note 1
45	209BW01B	0	22	
46	109PU21A	0	7.5	Note 1
47	109PU21B	0	7.5	
48	109PU22A	0	45	Note 1
49	109PU22B	0	45	
50	109PU23A	0	5.5	Note 1
51	109PU23B	0	5.5	
52	530PU31A	5	260	Previously running 2 pumps will automatically run after Power Recovery. Note 2
53	530PU31B	5	260	
54	530PU31C	5	260	
55	109BW02	5	18.5	
56	109BW03	5	18.5	
57	209BW02	10	18.5	
58	209BW03	10	18.5	
59	513PU01A	20	185	Previously running 2 pumps will automatically run after Power Recovery. Note 2
60	513PU01B	20	185	
61	513PU01C	20	185	
62	109BW04A	20	7.5	Note 1
63	109BW04B	20	7.5	

Item No.	Equipment Tag	Time Delay (s)	Capacity (kW)	Remarks
64	209BW04A	20	7.5	Note 1
65	209BW04B	20	7.5	
66	106FN01A	25	22.2	Selected Fan will automatically run after Power Recovery. Note 2.
67	106FN01B	25	22.2	
68	530CT31	30	112.2	Single Motor Note 2
69	521CP01A		96	Compressor will run automatically after Power Recovery by detecting low pressure in compressor package even though no signal from DCS.

Note 1: Previously running pump will run automatically after power recovery.
Note 2: Motors with large power requirement shall start alone.
Note 3: Upon power fail recovery, 102/202KBS-900/850: HPAL Pump Mechanical Seal System shall initiate the following sequence:

1. 102/202KBS850 shall be RESET by 102HS222 ; 102/202HV147 shall open
2. 102/202KBS900 : Running pump at the time of power failure shall re-start, then back-up N2 valve 102/202HV172 shall close

V. Alarms

None

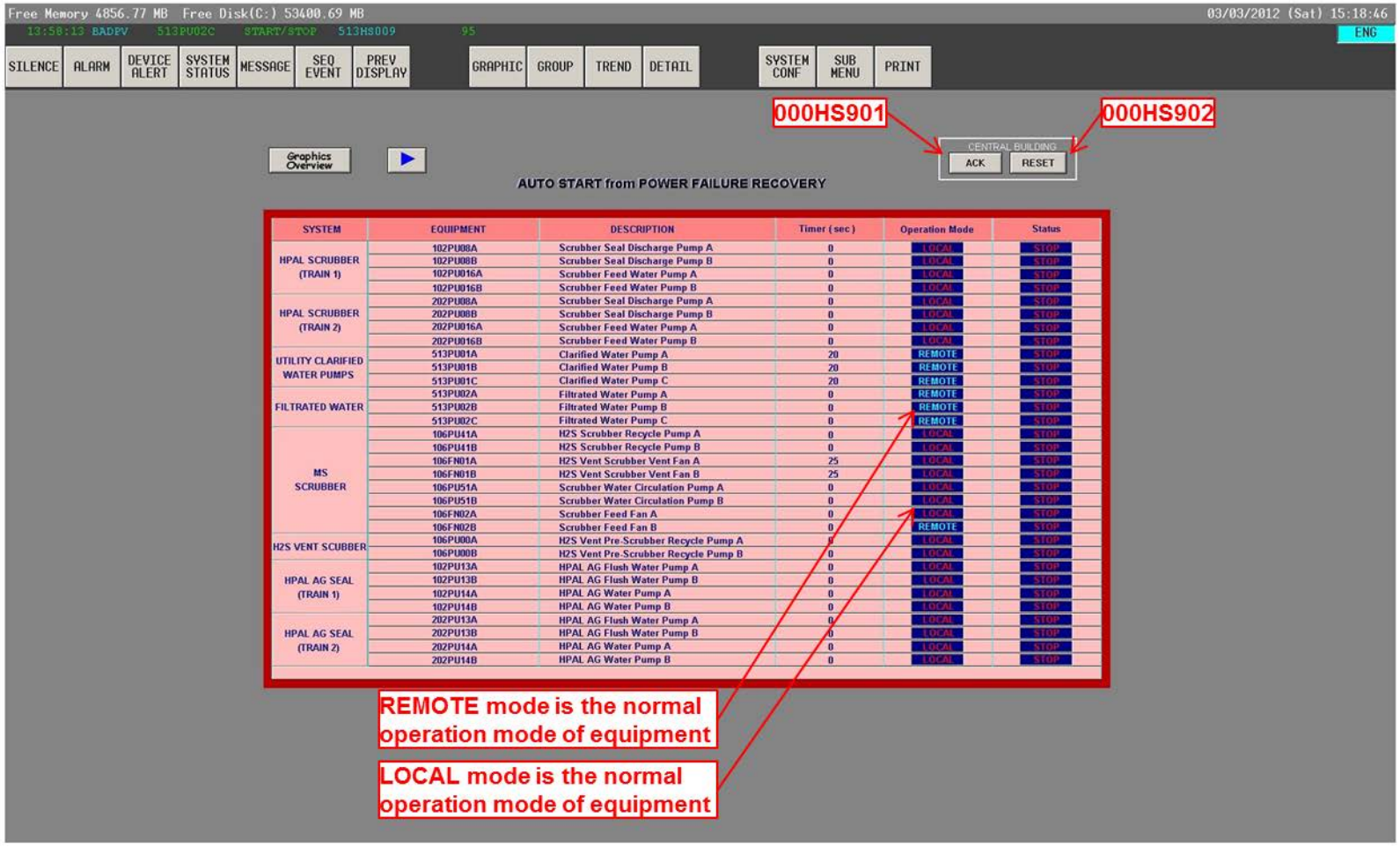
VI. DCS Emergency Shutdown

None

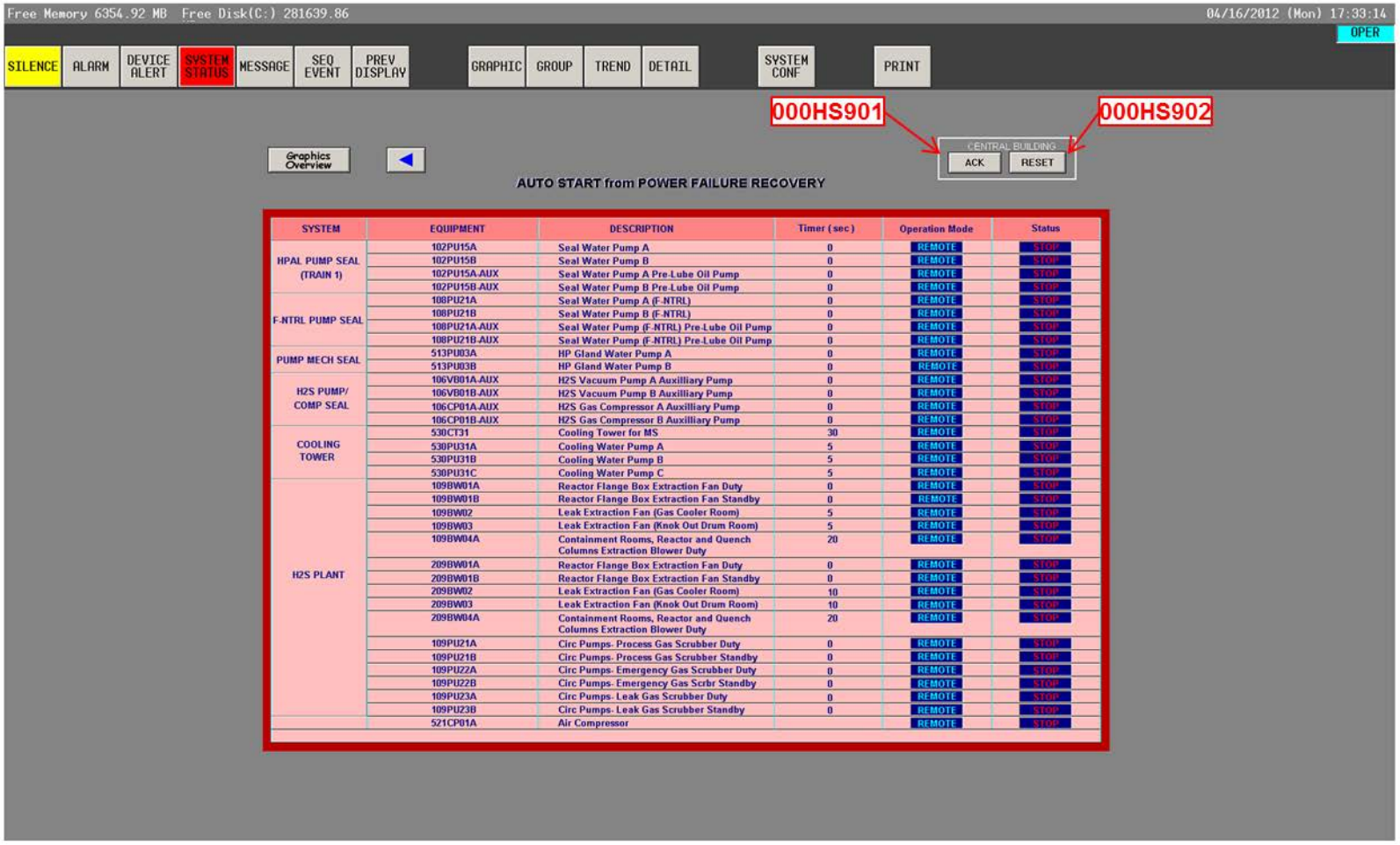
VII. Trend Graphs Grouping

None

Annex 1: AUTO START from POWER FAILURE RECOVERY DCS Graphics 1



Annex 2: AUTO START from POWER FAILURE RECOVERY DCS Graphics 2



SYSTEM	EQUIPMENT	DESCRIPTION	Timer (sec)	Operation Mode	Status
HPAL PUMP SEAL (TRAIN 1)	102PU15A	Seal Water Pump A	0	REMOTE	STOP
	102PU15B	Seal Water Pump B	0	REMOTE	STOP
	102PU15A-AUX	Seal Water Pump A Pre-Lube Oil Pump	0	REMOTE	STOP
	102PU15B-AUX	Seal Water Pump B Pre-Lube Oil Pump	0	REMOTE	STOP
F-NTRL PUMP SEAL	108PU21A	Seal Water Pump A (F-NTRL)	0	REMOTE	STOP
	108PU21B	Seal Water Pump B (F-NTRL)	0	REMOTE	STOP
	108PU21A-AUX	Seal Water Pump (F-NTRL) Pre-Lube Oil Pump	0	REMOTE	STOP
	108PU21B-AUX	Seal Water Pump (F-NTRL) Pre-Lube Oil Pump	0	REMOTE	STOP
PUMP MECH SEAL	513PU03A	HP Gland Water Pump A	0	REMOTE	STOP
	513PU03B	HP Gland Water Pump B	0	REMOTE	STOP
H2S PUMP/ COMP SEAL	106VB01A-AUX	H2S Vacuum Pump A Auxilliary Pump	0	REMOTE	STOP
	106VB01B-AUX	H2S Vacuum Pump B Auxilliary Pump	0	REMOTE	STOP
	106CP01A-AUX	H2S Gas Compressor A Auxilliary Pump	0	REMOTE	STOP
	106CP01B-AUX	H2S Gas Compressor B Auxilliary Pump	0	REMOTE	STOP
COOLING TOWER	530CT31	Cooling Tower for MS	30	REMOTE	STOP
	530PU31A	Cooling Water Pump A	5	REMOTE	STOP
	530PU31B	Cooling Water Pump B	5	REMOTE	STOP
	530PU31C	Cooling Water Pump C	5	REMOTE	STOP
H2S PLANT	109BW01A	Reactor Flange Box Extraction Fan Duty	0	REMOTE	STOP
	109BW01B	Reactor Flange Box Extraction Fan Standby	0	REMOTE	STOP
	109BW02	Leak Extraction Fan (Gas Cooler Room)	5	REMOTE	STOP
	109BW03	Leak Extraction Fan (Knok Out Drum Room)	5	REMOTE	STOP
	109BW04A	Containment Rooms, Reactor and Quench Columns Extraction Blower Duty	20	REMOTE	STOP
	209BW01A	Reactor Flange Box Extraction Fan Duty	0	REMOTE	STOP
	209BW01B	Reactor Flange Box Extraction Fan Standby	0	REMOTE	STOP
	209BW02	Leak Extraction Fan (Gas Cooler Room)	10	REMOTE	STOP
	209BW03	Leak Extraction Fan (Knok Out Drum Room)	10	REMOTE	STOP
	209BW04A	Containment Rooms, Reactor and Quench Columns Extraction Blower Duty	20	REMOTE	STOP
	109PU21A	Circ Pumps- Process Gas Scrubber Duty	0	REMOTE	STOP
	109PU21B	Circ Pumps- Process Gas Scrubber Standby	0	REMOTE	STOP
	109PU22A	Circ Pumps- Emergency Gas Scrubber Duty	0	REMOTE	STOP
	109PU22B	Circ Pumps- Emergency Gas Scrbr Standby	0	REMOTE	STOP
	109PU23A	Circ Pumps- Leak Gas Scrubber Duty	0	REMOTE	STOP
	109PU23B	Circ Pumps- Leak Gas Scrubber Standby	0	REMOTE	STOP
	521CP01A	Air Compressor		REMOTE	STOP