

แบบสอบถามความต้องการปรับปรุง HMI Remote Monitoring โรงไฟฟ้าเขื่อนเจ้าพระยา

ที่	ระบบ	รายละเอียด	หมายเหตุ
①	Common Overview.	1.) เครื่อง Generator Voltage / current 2.) เครื่อง Gate Position / Runner blade. 3.) เปลี่ยนตัว Actual Watt >> Active Power Actual VAR >> Reactive Power	
②	Common Overview.	1.) เปลี่ยนตัว Total Dis Chd Sum >> Discharge Accumulate. 2.) เปลี่ยนตัว Flow 2 Unit >> Total Flow Discharge.	
③	Auxiliary Status.	1.) เปลี่ยนตัว Amp เป็น Motor Current.	
④	AI Status.	1.) on หน้า 2 และ 3 Cold Column. หมายเหตุ 2.) on Turbine Radial Tile Temperature บน CPD-H02 1 และ 2	
⑤	Vibration Status.	1.) เครื่อง. หมายเหตุ. ของตัว Vibration.	
⑥	Sound Alarm for Operator. หมายเหตุ. - Lock out Relay - Level sump pit - Alarm Annunciator.	6.1. ขั้วไฟ ลามก 9 วัตต์ เปลี่ยนเป็น และใช้หลอด son led 6 วัตต์ ที่ HMI, Vol 100V, Bottom. หมายเหตุ เดิมที 1.5 วัตต์ 9 วัตต์	

[illegible]

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

บันทึก

ที่	ทดท-ฟ. 16 /2564	เรียน	
จาก	แผนกเดินเครื่องกะ3		
เรื่อง	ปรับปรุงหน้าจอ HMI CPD ที่ CCA.	หฟท-ฟ.	
วันที่	29 พฤษภาคม 2564		

เนื่องด้วยงานปรับปรุงระบบควบคุมการเดินเครื่องทางไกลของโรงไฟฟ้าพลังน้ำเขื่อนเจ้าพระยา เครื่องที่1 และ2 ได้ดำเนินการแล้วเสร็จและได้นำมาใช้งานที่ โรงไฟฟ้าเขื่อนภูมิพล มาระยะหนึ่งแล้ว ทดท1-4-ฟ. จึงเห็นควรจะต้องดำเนินการปรับปรุงและเพิ่มเติมหน้าจอHMI สำหรับการเดินเครื่องทางไกลของโรงไฟฟ้าพลังน้ำเขื่อนเจ้าพระยา ให้มีความครอบคลุมในการใช้งานมากยิ่งขึ้น

ดังนั้นจึงขอความอนุเคราะห์ หฟท-ฟ. โปรดดำเนินการจัดทำเพิ่มรายละเอียดตามเอกสารแนบ

จึงเรียนมาเพื่อโปรดพิจารณา



(นายสิริบิล โพธา)

ทดท3-ฟ.

Control room : 04-743 2110

ต้นฉบับ : แฟ้มบันทึก ทดท-ฟ.

เอกสารแนบ

รายละเอียดความต้องการปรับปรุง HMI Remote Monitoring

ที่	ระบบ	รายละเอียด	หมายเหตุ
1	Common Overview	1.เพิ่ม Generator Voltage/Current 2.เพิ่ม Gate Position/RunnerBlade 3.เปลี่ยนคำว่า Actual Watt เป็น Active Power 4.เปลี่ยนคำว่า Actual Var เป็น Reactive Power 5.เปลี่ยนคำว่า Total Dis Oil Sum เป็น Discharge Accumulate 6.เปลี่ยนคำว่า Flow 2 Unit เป็น Total Flow Discharge	
2	Auxiliary Status	1.เปลี่ยนคำว่า Amp. เป็น Motor Current	
3	AI Status	1.ตารางที่ 2 และ3 ไม่มี Column หน่วยของค่า 2.ค่า Turbine Radial Tile Temperature ของ CPD-02 ไม่มี	
4	Vibration Status	1.เพิ่มหน่วยของค่า Vibration	
5	-Sound Alarm -Lock Out Relay -Level Sump Pit - Alarm Annunciator	1.ยังไม่สามารถใช้งานได้เหมือนเดิมที่หน้าจอ HMI	
6	Event Status	1. Page Commom ทำ Menu Link ดู Event ของ Gen&ระบบ	
7	Volte Line Pea.	1. หน้า Common	
8	เพิ่มจอคอมพิวเตอร์เป็น 2 จอ	1. เพื่อใช้งานด้านเดินเครื่อง 1 จอ และจอสำหรับดู Volte Line Pea , Auxilaly อีก 1 จอ	

29/MAY/21

09:06:35

CPD COMMON

BUZZER RESET

STATIC HEAD

7.470
m.MSL

WATER LEVEL

RESERVOIR 12.85 m.MSL

TAILRACE 5.385 m.MSL

UNIT 1

ACTUAL WATT

4260 kW

SETPOINT 4300

ACTUAL VAR

422.7 kVAR

SETPOINT 450.0

RUNNING HORUS 901 * 30 *

NUMBER OF STRAT 46

TOTAL DISCHARGE 330389848 m³DIS. FLOW 61.56 m³/s

TOTAL DIS. OLD SUM

07767389848 m³

UNIT 2

ACTUAL WATT

0.000 kW

SETPOINT 850.0

ACTUAL VAR

0.000 kVAR

SETPOINT 450.0

RUNNING HORUS 854 * 38 *

NUMBER OF STRAT 44

TOTAL DISCHARGE 316496608 m³DIS. FLOW 0.000 m³/s

TOTAL DIS. OLD SUM

09677496608 m³

Station Service

6778265

kWH

105331

kVAR

FLOW 2 UNITS

62.11 m³/s

MAN

AUTO

TAILRACE

MSL

OK

GO TO UNIT 1

SINGLE LINE

AUXILARY

ANNUNCIATOR

GO TO UNIT 2

	CPD UNIT 1		GENERATOR			LINE		TURBINE			WATER LEVEL	
			ACTIVE POWER 4298 kW	VOLTAGE <i>ab</i> 6830 V	CURRENT <i>a</i> 372.9 A	LINE VOLTAGE A-B 22680 V	SPEED 125.1 RPM	SPEED 100.1 %	RESERVOIR 12.85 m.MSL			
			REACTIVE POWER 435.5 kVAR	VOLTAGE <i>bc</i> 6816 V	CURRENT <i>b</i> 356.3 A	LINE VOLTAGE B-C 22844 V	GV POSITION 74.50 %	GATE LIMIT 100.0 %	TAILRACE 5.382 m.MSL			
			GEN FREQUENCY 50.06 Hz	VOLTAGE <i>ca</i> 6864 V	CURRENT <i>c</i> 363.1 A	LINE VOLTAGE C-A 22661 V	RB POSITION 63.24 %	DISCHARGE FLOW 61.69 m ³ /s	DRAINAGE 756.12 mm.			
29/MAY/21 09:07:18												

UNIT OPERATE

UNIT 1 CONTROL MODE

ACKNOWLEDGE

RESET

05-1

05-2

05-3

05-1R

05-L1

05-L2

GROUP LOCK OUT OPERATED

22KV PEA LINE 1

VAR 01309 kVAR

FROM BATTERY 125VDC

CB2212

31F

AVR

41DC

CB612

BPE

LOAD ^_/_^

START/STOP

STATUS

TIME 1 = 11 s

ACTUAL WATT

4298 kW

SETPOINT

4300 kW

AUTO RAMP RATE STATUS: ☐ RUNNING ☐ STOP

ACTUAL VAR

435.5 kVAR

SETPOINT

450.0 kVAR

VAR AUTO: ☐ ON ☐ OFF ☐ UP ☐ DN

EXCITATION

STATUS

TIME 0 = 11 s

FIELD VOLT

81.59 V

AVR MODE OPERATION

AVR VLT > 50K

FIELD CURRENT

320.4 A

AVR CTAL ON

AUTO

MANUAL

START

STATUS

TIME 0 = 19 s

UNIT SPEED

125.1 RPM

GV POSITION

74.500

RB POSITION

63.248

PREPARATION

STATUS

TIME 1 = 24 s

ORIGINAL LUBRICATION OIL FLOW ON

GENERATOR RADIAL BEARING LUBRICATION OIL FLOW ON

GENERATOR POSITIVE PULLEY LUBRICATION OIL FLOW ON

GENERATOR COUNTER PULLEY LUBRICATION OIL FLOW ON

TURBINE RADIAL BEARING LUBRICATION OIL FLOW ON

HAUL SHAFT SEAL WATER FLOW ON

AUX COOLER COOLING WATER FLOW ON

OIL COOLING CIRCULAR WATER FLOW ON

STOP

STATUS

REPAIR SEAL

SEAL LOCK

AIR BRAKE

ON

STATIC HEAD

7.476 m.MSL

RUNNING HOURS

901 + 31

NUMBER OF STRAT

46

TOTAL DISCHARGE

330392514 m³DIS. FLOW 61.69 m³/sFLOW UNITS 61.71 m³/s

TOTAL DIS. OLD SUM

07767392514 m³

GO TO UNIT 2

COMMON

UNIT OPERATE

GOV CONTROL

AVR CONTROL

AUXILIARY STATUS

GOV OIL SYSTEM

ALARM ANNUNCIATOR

TRIP ANNUNCIATOR

GOV PROP VALVE

MACHINE STATUS

AI STATUS

SINGLE LINE

LUB. OIL SYSTEM

WATER SYSTEM

VIBRATION

SYSTEM OVERVIEW

MAINTENANCE



CPD UNIT 1

29/MAY/21 09:07:37

GENERATOR						LINE		TURBINE				WATER LEVEL								
ACTIVE POWER	4312	KW	VOLTAGE <i>ab</i>	6837	V	CURRENT <i>a</i>	373.6	A	LINE VOLTAGE A-B	22712	V	SPEED	125.1	RPM	SPEED	100.1	%	RESERVOIR	12.85	m.MSL
REACTIVE POWER	452.0	KVAR	VOLTAGE <i>bc</i>	6822	V	CURRENT <i>b</i>	357.4	A	LINE VOLTAGE B-C	22884	V	GV POSITION	74.60	%	GATE LIMIT	100.0	%	TAILRACE	5.381	m.MSL
GEN FREQUENCY	50.07	Hz	VOLTAGE <i>ca</i>	6872	V	CURRENT <i>c</i>	363.8	A	LINE VOLTAGE C-A	22703	V	RB POSITION	63.23	%	DISCHARGE FLOW	61.72	m ³ /s	DRAINAGE	751.05	mm.

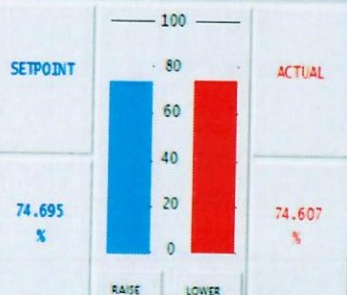
GOVERNOR CONTROL

GATE LIMIT



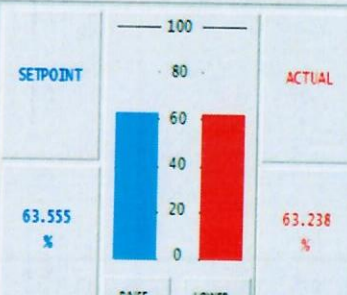
RAISE LOWER

GUIDE VANE



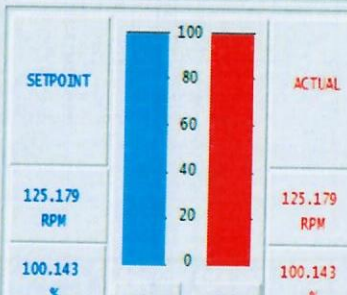
RAISE LOWER

RUNNER BALDE



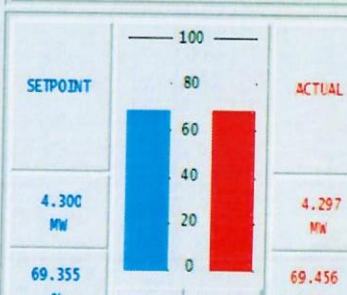
RAISE LOWER

TURBINE SPEED



RAISE LOWER

ACTIVE POWER



RAISE LOWER

CONTROL PANEL

GOVERNOR MODE SELECT

GV SPEED MW

GV START VALVE (DV2)

A M ON OFF ON OFF

GV SLOW CLOSE VALVE (DV3)

A M ON OFF ON OFF

RB START VALVE (DV1)

A M ON OFF ON OFF

GOVERNOR STATUS

- DROP2 READY
- DROPS2 READY
- TURBINE START
- GCB CLOSE
- GOVERNOR TRIP
- GOVERNOR ALARM
- GOVERNOR READY
- GOVERNOR NO TRIP
- SPEED CONTROL MODE
- GOVERNOR AUTO MODE
- MANUAL STEP GV OFF
- MANUAL GV OUTPUT OFF
- MANUAL RB OUTPUT OFF
- RELATION ON
- GOV VALVE AUTO

GOVERNOR LOOP

ON CAM

OFF CAM

TRIP

- GUIDE VANE FEEDBACK FAIL
- GUIDE VANE LARGE DEVIATE
- RB FEEDBACK FAIL
- RB LARGE DEVIATE
- MEASURE SPEED DEVICE FAIL
- SM EMERGENCY PB
- GV MDV FEEDBACK FAIL
- RB MDV FEEDBACK FAIL
- MW LARGE DEVIATE

ALARM

- FREQUENCY FEEDBACK 1 FAIL
- MW FEEDBACK 1 FAIL
- FREQUENCY FEEDBACK 2 FAIL
- MW FEEDBACK 2 FAIL
- SPEED RELAY 1 FAIL
- SPEED RELAY 2 FAIL
- SPEED RELAY 3 FAIL
- BULK POWER SUPPLY FAIL
- PRIMARY SUPPLY 125VDC FAIL
- SECONDARY SUPPLY 220VAC FAIL
- DV2 GV START VALVE NOT ACTION
- DV3 GV SLOW CLOSE VALVE NOT ACTION
- DV1 RB START VALVE NOT ACTION
- DROP2 NOT READY
- DROPS2 NOT READY
- GV CTRL OIL PRESSURE TRANS FAIL
- RB CTRL OIL PRESSURE TRANS FAIL

RESET

GO TO UNIT 2

COMMON

UNIT OPERATE

GOV CONTROL

AVR CONTROL

AUXILIARY STATUS

GOV OIL SYSTEM

ALARM ANNUNCIATOR

TRIP ANNUNCIATOR

GOV PROP VALVE

MACHINE STATUS

AI STATUS

SINGLE LINE

LUB. OIL SYSTEM

WATER SYSTEM

VIBRATION

SYSTEM OVERVIEW

MAINTENANCE



CPD UNIT 1

29/MAY/21 09:07:56

GENERATOR						LINE		TURBINE				WATER LEVEL								
ACTIVE POWER	4315	KW	VOLTAGE ab	6831	V	CURRENT a	374.5	A	LINE VOLTAGE A-B	22697	V	SPEED	125.1	RPM	SPEED	100.1	%	RESERVOIR	12.85	m.MSL
REACTIVE POWER	473.3	KVAR	VOLTAGE bc	6822	V	CURRENT b	357.9	A	LINE VOLTAGE B-C	22874	V	GV POSITION	74.64	%	GATE LIMIT	100.0	%	TAILRACE	5.385	m.MSL
GEN FREQUENCY	50.06	Hz	VOLTAGE ca	6866	V	CURRENT c	364.3	A	LINE VOLTAGE C-A	22687	V	RB POSITION	63.27	%	DISCHARGE FLOW	62.01	m ³ /s	DRAINAGE	746.57	mm.
* * * * *																				

AVR CONTROL

EXCITATION STATUS

GENERATOR VOLTAGE	6 870	kV
GENERATOR CURRENT	379.6	A
FIELD VOLTAGE	79.17	V
FIELD CURRENT	322.4	A
CONVERTER BRIDGE A	171.1	A
CONVERTER BRIDGE B	151.0	A
CONVERTER BRIDGE A TEMP.	34.83	C
CONVERTER BRIDGE B TEMP.	34.87	C

EXCITATION STATUS

- EXCITATION SYSTEM ALARM
- FIELD CB CLSOE
- FIELD CB OPEN
- EXCITATION SYSTEM TRIP
- EXCITATION READY TO START
- SPARE
- SPARE
- SPARE
- SPARE
- SPARE

AVR SETTER

VOLTAGE SETTER

FIELD SETTER

MVAR SETTER

6831 V

322.4 A

0.465 Mvar

RESET

RAISE

LOWER

AVR MODE OPERATION

MVAR CTRL ON

AUTO

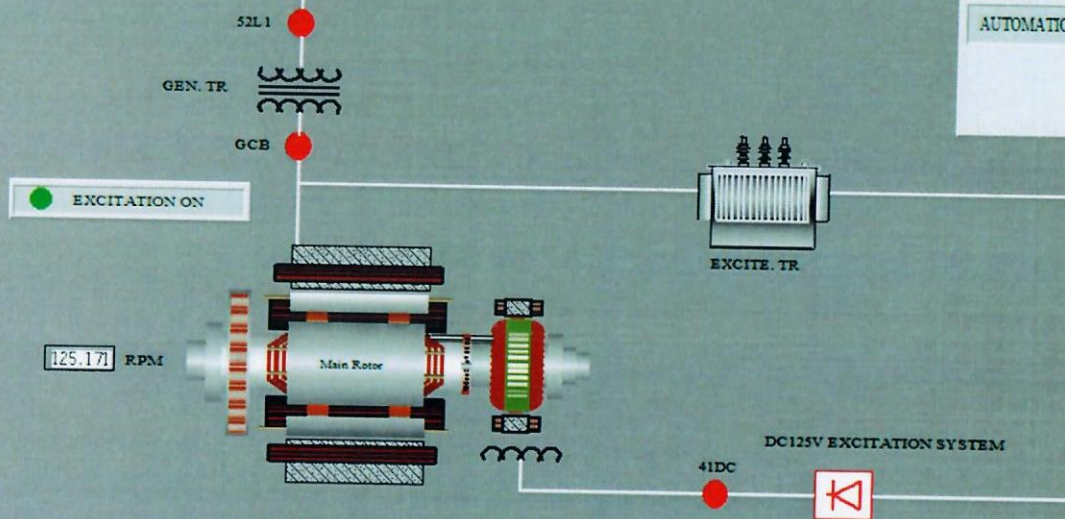
MANUAL

EXCITATION STATUS

- EXCITE TRANSFORMER TEMP HIGH ALARM
- EXCITE TRANSFORMER TEMP HIGH TRIP

AUTOMATIC LINE VOLTAGE CONTROL

ALVC UNIT1



GO TO UNIT 2

COMMON

UNIT OPERATE

GOV CONTROL

AVR CONTROL

AUXILIARY STATUS

GOV OIL SYSTEM

ALARM ANNUNCIATOR

TRIP ANNUNCIATOR

GOV PROP VALVE

MACHINE STATUS

AI STATUS

SINGLE LINE

LUB. OIL SYSTEM

WATER SYSTEM

VIBRATION

SYSTEM OVERVIEW

MAINTENANCE

Ready

LAI CAP SCPL



CPD UNIT 1

29/MAY/21 09:08:17

GENERATOR						LINE		TURBINE				WATER LEVEL								
ACTIVE POWER	4302	KW	VOLTAGE <i>ab</i>	6825	V	CURRENT <i>a</i>	372.8	A	LINE VOLTAGE A-B	22684	V	SPEED	125.1	RPM	SPEED	100.1	%	RESERVOIR	12.85	m.MSL
REACTIVE POWER	460.5	KVAR	VOLTAGE <i>bc</i>	6825	V	CURRENT <i>b</i>	357.1	A	LINE VOLTAGE B-C	22846	V	GV POSITION	74.99	%	GATE LIMIT	100.0	%	TAILRACE	5.382	m.MSL
GEN FREQUENCY	50.05	Hz	VOLTAGE <i>ca</i>	6863	V	CURRENT <i>c</i>	363.9	A	LINE VOLTAGE C-A	22665	V	RB POSITION	63.59	%	DISCHARGE FLOW	61.80	m3/s	DRAINAGE	741.90	mm

AUXILIARY STATUS

LUBRICATION PUMP

LUBRICATION PUMP NO. 1



2:57

STAND BY

RUN

REMOTE

AUTO

MANUAL

START

STOP

AMP. = 9.1

STATUS:OK!

LUBRICATION PUMP NO. 2



0:01

MAIN

STOP

REMOTE

AUTO

MANUAL

START

STOP

AMP. = 0.0

STATUS:OK!

AC JACKING PUMP

AC JACKING PUMP NO. 1



MAIN

STOP

REMOTE

AUTO

MANUAL

START

STOP

STATUS:OK!

AC JACKING PUMP NO. 2



STAND BY

STOP

REMOTE

AUTO

MANUAL

START

STOP

STATUS:OK!

GOV OIL PUMP

GOV OIL PUMP NO. 1



MAIN

STOP

REMOTE

AUTO

MANUAL

START

STOP

AMP. = 0.5

STATUS:OK!

GOV OIL PUMP NO. 2



STAND BY

STOP

REMOTE

AUTO

MANUAL

START

STOP

AMP. = 0.2

STATUS:OK!

LEAKAGE PUMP



STOP

REMOTE

AUTO

AUTO

MANUAL

OPEN

CLOSE

DC JACKING PUMP



STOP

REMOTE

AUTO

AUTO

MANUAL

OPEN

CLOSE

GRAVITY VALVE
20B2-1 (EMERGENCY)


FULLY CLOSE

AUTO

AUTO

MANUAL

OPEN

CLOSE

MAIN SHAFT SEAL
20B2-3 (MAIN)


FULLY OPEN

AUTO

AUTO

MANUAL

OPEN

CLOSE

MAIN SHAFT SEAL
20B2-2 (EMERGENCY)


FULLY CLOSE

AUTO

AUTO

MANUAL

OPEN

CLOSE

MAIN WATER COOLING
20B1-1


FULLY OPEN

AUTO

AUTO

MANUAL

OPEN

CLOSE

GO TO PAGE 2

GO TO UNIT 2

COMMON

UNIT OPERATE
MACHINE STATUSGOV CONTROL
AI STATUSAVR CONTROL
SINGLE LINEAUXILIARY STATUS
LUB. OIL SYSTEMGOV OIL SYSTEM
WATER SYSTEMALARM ANNUNCIATOR
VIBRATIONTRIP ANNUNCIATOR
SYSTEM OVERVIEWGOV PROP VALVE
MAINTENANCE

	CPD UNIT 1		GENERATOR				LINE		TURBINE			WATER LEVEL	
			ACTIVE POWER 4327 kW	VOLTAGE <i>ab</i> 6831 V	CURRENT <i>a</i> 375.0 A	LINE VOLTAGE A-B 22690 V	SPEED 125.1 RPM	SPEED 100.1 %	RESERVOIR 12.84 m.MSL				
			REACTIVE POWER 441.0 KVAR	VOLTAGE <i>bc</i> 6820 V	CURRENT <i>b</i> 358.6 A	LINE VOLTAGE B-C 22864 V	GV POSITION 74.58 %	GATE LIMIT 100.0 %	TAILRACE 5.384 m.MSL				
			GEN FREQUENCY 50.05 Hz	VOLTAGE <i>ca</i> 6864 V	CURRENT <i>c</i> 366.0 A	LINE VOLTAGE C-A 22680 V	RB POSITION 63.37 %	DISCHARGE FLOW 62.79 m ³ /s	DRAINAGE 774.93 mm.				
29/MAY/21 09:05:59													

GOVERNOR OIL SYSTEM

GOV OIL PUMP

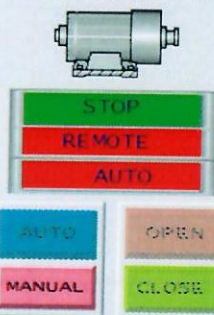
GOV OIL PUMP NO. 1



GOV OIL PUMP NO. 2



LEAKAGE PUMP



PRESSURE OIL TANK

- OIL PRESSURE 1 (PT-1) HIGH ALARM
- OIL PRESSURE 2 (PT-2) LOW TRIP

ANALOG VALUE

GOV OIL PRESSURE	36.79 MPa
GOV OIL PRESSURE TANK LEVEL	497.5 mm
GOV OIL SUMP TANK LEVEL	327.4 mm
LEAKAGE OIL LEVEL	123.1 mm
NO.1 GOV OIL PUMP CURRENT FEEDBACK	0.41 A
NO.2 GOV OIL PUMP CURRENT FEEDBACK	0.21 A
OIL SUMP 1 TEMPERATURE	0.00 C
OIL SUMP 2 TEMPERATURE	0.00 C

GO TO UNIT 2

COMMON

UNIT OPERATE

GOV CONTROL

AVR CONTROL

AUXILIARY STATUS

GOV OIL SYSTEM

ALARM ANNUNCIATOR

TRIP ANNUNCIATOR

GOV PROP VALVE

MACHINE STATUS

AI STATUS

SINGLE LINE

LUB. OIL SYSTEM

WATER SYSTEM

VIBRATION

SYSTEM OVERVIEW

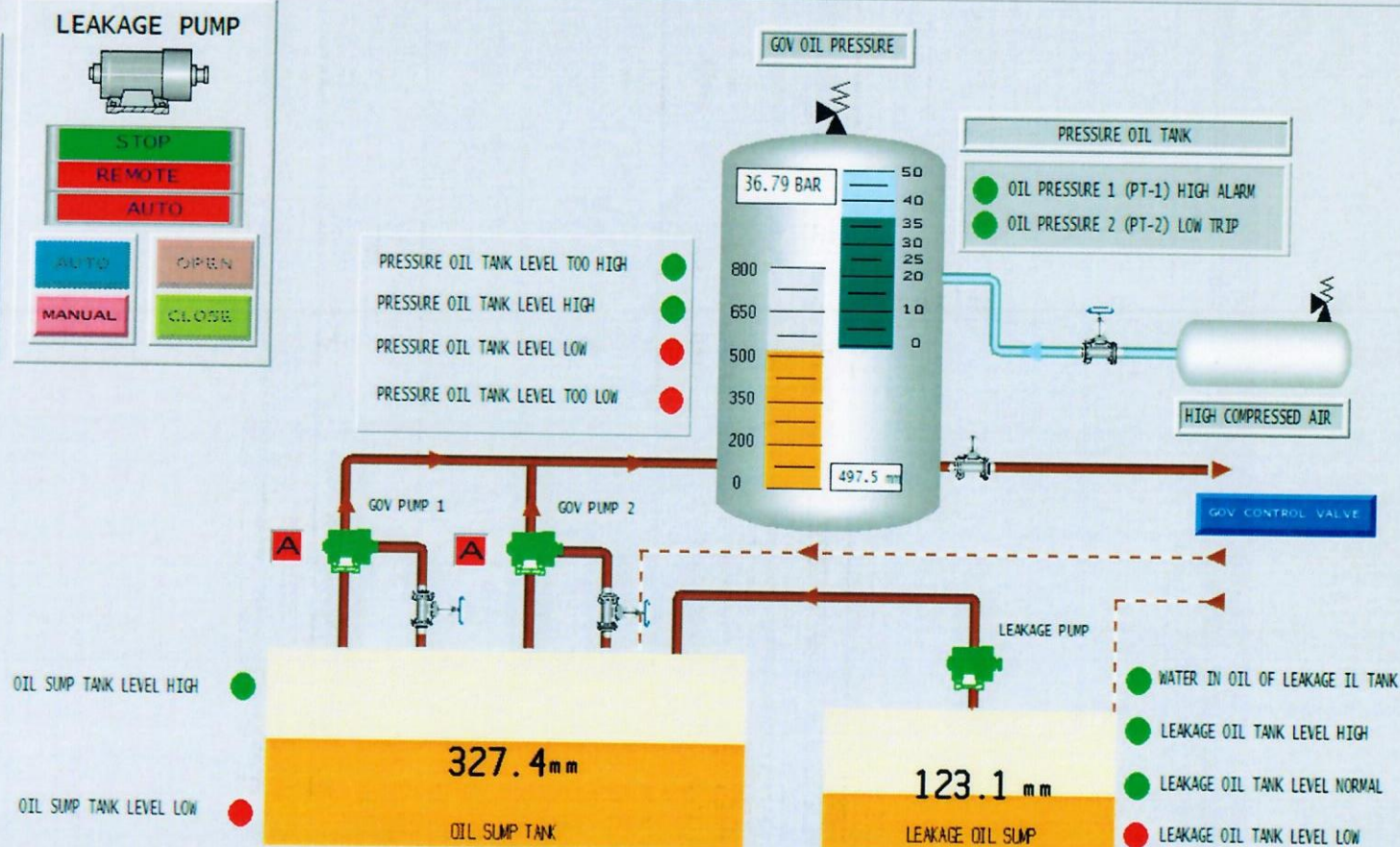
MAINTENANCE

Ready

Error! Zoom rectangle too small.

LAI CAP

SCR



	CPD UNIT 1		GENERATOR				LINE		TURBINE			WATER LEVEL		
	ACTIVE POWER	4298 kW	VOLTAGE <i>ab</i>	6821 V	CURRENT <i>a</i>	373.1 A	LINE VOLTAGE A-B	22666 V	SPEED	125.0 RPM	SPEED	100.0 %	RESERVOIR	12.85 m.MSL
	REACTIVE POWER	495.3 kVAR	VOLTAGE <i>bc</i>	6822 V	CURRENT <i>b</i>	356.9 A	LINE VOLTAGE B-C	22837 V	GV POSITION	74.72 %	GATE LIMIT	100.0 %	TAILRACE	5.391 m.MSL
	GEN FREQUENCY	50.01 Hz	VOLTAGE <i>ca</i>	6860 V	CURRENT <i>c</i>	364.1 A	LINE VOLTAGE C-A	22648 V	RB POSITION	63.25 %	DISCHARGE FLOW	62.16 m ³ /s	DRAINAGE	724.09 mm.
29/MAY/21 09:12:06														

TURBINE GUIDE BEARING

THRUST BEARING

COUNTER THRUST BEARING

GEN GUIDE BEARING

GENERATOR RADIAL TILE TEMPERATURE DJ1 43.36 C

GENERATOR RADIAL TILE TEMPERATURE 43.36 C

AC/DC JACK OIL SUPPLY

BACK

SUPPLY

DRAIN

STATOR WINDING TEMPERATURE RZ1 59.71 C
 STATOR WINDING TEMPERATURE RZ2 70.47 C
 STATOR WINDING TEMPERATURE RZ3 71.67 C

STATOR CORE TEMPERATURE TX1 60.03 C
 STATOR CORE TEMPERATURE TX2 66.88 C
 STATOR CORE TEMPERATURE TX3 54.23 C

COUNTER THRUST TILE 1 TEMPERATURE 39.96 C

COUNTER THRUST TILE 2 TEMPERATURE 45.74 C

THRUST TILE 1 TEMPERATURE 46.65 C

THRUST TILE 2 TEMPERATURE 40.51 C

TURBINE RADIAL TILE TEMPERATURE 41.38 C

HYDRAULIC OIL TANK TEMPERATURE 39.56 C
 HYDRAULIC PUMPING STATION TEMPERATURE 0.00 C

INLET AIR TEMPERATURE OF AIR COOLER 36.95 C
 OUTLET AIR TEMPERATURE OF AIR COOLER 45.50 C
 AIR COOLER WATER OUTLET TEMPERATURE KL2 34.35 C
 WIND INLET OF AIR COOLER TEMPERATURE 37.51 C
 WIND OUTLET OF AIR COOLER TEMPERATURE 45.50 C

COLD AIR 1 TEMPERATURE 37.66 C
 COLD AIR 2 TEMPERATURE 37.51 C
 HOT AIR 1 TEMPERATURE 46.53 C
 HOT AIR 2 TEMPERATURE 45.89 C

STATOR CORE 1 TEMPERATURE 61.14 C
 STATOR CORE 2 TEMPERATURE 58.20 C
 STATOR CORE 3 TEMPERATURE 61.94 C
 STATOR CORE 4 TEMPERATURE 55.74 C
 STATOR CORE 5 TEMPERATURE 53.19 C
 STATOR CORE 6 TEMPERATURE 0.00 C

STATOR WINDING 1 TEMPERATURE 61.94 C
 STATOR WINDING 2 TEMPERATURE 0.00 C
 STATOR WINDING 4 TEMPERATURE 0.00 C
 STATOR WINDING 5 TEMPERATURE 60.11 C
 STATOR WINDING 7 TEMPERATURE 55.74 C
 STATOR WINDING 9 TEMPERATURE 13.65 C
 STATOR WINDING 10 TEMPERATURE 61.70 C
 STATOR WINDING 11 TEMPERATURE 65.29 C
 STATOR WINDING 12 TEMPERATURE 65.77 C

TURBINE RADIAL TILE TEMPERATURE HGI 41.30 C
 THRUST TILE TEMPERATURE ZT1 47.00 C
 COUNTER THRUST TILE TEMPERATURE FT1 39.96 C

STATUS

- GENERAL LUBRICATION OIL FLOW ON
- GEN. RADIAL BEARING LUB OIL FLOW ON
- GEN. POSITIVE THRUST PAD LUB OIL FLOW ON
- GEN. COUNTER THRUST PAD LUB OIL FLOW ON
- COMBINATION BEARING RETURN LUB OIL FLOW ON
- TURBINE RADIAL BEARING LUB OIL FLOW ON
- TURBINE RADIAL BEARING LUB OIL PRESSURE ON
- GEN. POSITIVE THRUST TILE OIL PRESSURE ON
- GEN. COUNTER THRUST TILE OIL PRESSURE ON
- GEN. RADIAL BEARING LUB OIL PRESSURE ON
- TURBINE LIFT OIL PRESSURE LOW
- TURBINE LIFT OIL PRESSURE TOO LOW
- GENERATOR LIFT OIL PRESSURE LOW
- GENERATOR LIFT OIL PRESSURE TOO LOW
- LIFT OIL DIFFERENTIAL PRESSURE ALARM
- LIFT OIL PUMP PRESSURE 1
- LIFT OIL PUMP PRESSURE 2

GENERATOR LIFT OIL PRESSURE 8.676 MPa

TURBINE LIFT OIL PRESSURE 6.677 MPa

GO TO UNIT 2

COMMON

UNIT OPERATE

MACHINE STATUS

GOV CONTROL

AI STATUS

AVR CONTROL

SINGLE LINE

AUXILIARY STATUS

LUB. OIL SYSTEM

GOV OIL SYSTEM

WATER SYSTEM

ALARM ANNUNCIATOR

VIBRATION

TRIP ANNUNCIATOR

SYSTEM OVERVIEW

GOV PROP VALVE

MAINTENANCE



CPD UNIT 1

29/MAY/21 09:02:47

GENERATOR				LINE		TURBINE				WATER LEVEL										
ACTIVE POWER	4290	kW	VOLTAGE ab	6842	V	CURRENT a	371.0	A	LINE VOLTAGE A-B	22750	V	SPEED	125.1	RPM	SPEED	100.1	%	RESERVOIR	12.84	m.MSL
REACTIVE POWER	425.7	kVAR	VOLTAGE bc	6840	V	CURRENT b	354.5	A	LINE VOLTAGE B-C	22916	V	GV POSITION	74.85	%	GATE LIMIT	100.0	%	TAILRACE	5.390	m.MSL
GEN FREQUENCY	50.05	Hz	VOLTAGE ca	6878	V	CURRENT c	361.9	A	LINE VOLTAGE C-A	22728	V	RB POSITION	63.27	%	DISCHARGE FLOW	62.36	m3/s	DRAINAGE	819.99	mm

AI STATUS

TAG	DESCRIPTION	VALUE		TAG	DESCRIPTION	VALUE		TAG	DESCRIPTION	VALUE	
FLOW				TEMPERATURE GENERATOR & TURBINE				TEMPERATURE GENERATOR & TURBINE			
U1_AI001	LUBE OIL FLOW 80-1	101.250	L/m	U1_RTD001	STATOR CORE TEMPERATURE TX1	59.95		U1_RTD007	INLET AIR TEMPERATURE OF AIR COOLER	36.95	
U1_AI002	GEN. BEARING OIL FLOW 80-2	47.97	L/m	U1_RTD002	STATOR CORE TEMPERATURE TX2	66.56		U1_RTD008	OUTLET AIR TEMPERATURE OF AIR COOLER	45.50	
U1_AI003	POSITIVE THRUST BEARING OIL FLOW 80-3	39.71	L/m	U1_RTD003	STATOR CORE TEMPERATURE TX3	54.23		U1_RTD013	LUBRICATION OIL TEMPERATURE YC1	40.12	
U1_AI004	COUNTER THRUST BEARING OIL FLOW 80-4	61.27	L/m	U1_RTD004	STATOR WINDING TEMPERATURE RZ1	59.55		U1_RTD014	AIR COOLER WATER OUTLET TEMPERATURE KL2	34.27	
U1_AI005	COMBINATION BEARING OIL FLOW 80-5	25.78	L/m	U1_RTD005	STATOR WINDING TEMPERATURE RZ2	69.99		U1_RTD019	WIND INLET OF AIR COOLER TEMPERATURE	37.51	
U1_AI006	TURBINE BEARING OIL FLOW 80-6	28.65	L/m	U1_RTD006	STATOR WINDING TEMPERATURE RZ3	71.27		U1_RTD020	WIND OUTLET OF AIR COOLER TEMPERATURE	45.50	
U1_AI007	MAIN SHAFT SEAL WATER FLOW 80-7	25.98	L/m	U1_RTD009	TURBINE RADIAL TILE TEMPERATURE HG1	41.14		U1_RTD023	GRAVITY OIL TANK TEMPERATURE	34.19	
U1_AI008	COOLING WATER OF AIR COOLER FLOW 80-8	712.60	L/m	U1_RTD010	THRUST TILE TEMPERATURE ZT1	47.00		U1_RTD024	HYDRAULIC OIL TANK TEMPERATURE	39.56	
U1_AI009	COOLING WATER OF AIR COOLER FLOW 80-9	0.008	L/m	U1_RTD011	COUNTER THRUST TILE TEMPERATURE FT1	39.88		U1_RTD025	HYDRAULIC PUMPING STATION TEMPERATURE	0.008	
PRESSURE				U1_RTD012	GENERATOR RADIAL TILE TEMPERATURE DJ1	43.28		U1_RTD026	COLD AIR 1 TEMPERATURE	37.66	
U1_AI010	PRESSURE GOV OIL	37.19	Bar	U1_RTD015	THRUST TILE 1 TEMPERATURE	46.85		U1_RTD029	COLD AIR 2 TEMPERATURE	37.51	
U1_AI020	BREAK AIR PRESSURE	0.008		U1_RTD016	THRUST TILE 2 TEMPERATURE	40.43		U1_RTD050	HOT AIR 1 TEMPERATURE	46.45	
U1_AI022	OVERALL COOLING WATER PRESSURE	69.57		U1_RTD017	COUNTER THRUST TILE 1 TEMPERATURE	39.88		U1_RTD051	HOT AIR 2 TEMPERATURE	45.82	
U1_AI023	GENERATOR LIFT OIL PRESSURE	8.67		U1_RTD018	COUNTER THRUST TILE 2 TEMPERATURE	45.66		U1_RTD052	GENERAL COOLING WATER TEMPERATURE	34.66	
U1_AI024	TURBINE LIFT OIL PRESSURE	6.65		U1_RTD021	GENERATOR RADIAL TILE TEMPERATURE	43.28		U1_RTD058	COOLING WATER OUTLET OF AIR COOLING TEMPERATURE	34.74	
LEVEL				U1_RTD022	TURBINE RADIAL TILE TEMPERATURE	41.30		U1_RTD059	COOLING WATER OUTLET OF OIL COOLING TEMPERATURE	34.42	
U1_AI015	GOV OIL PRESSURE TANK OIL LEVEL	515.45	mm.	U1_RTD027	STATOR CORE 1 TEMPERATURE	61.14		ETC.			
U1_AI016	GOV SUMP TANK OIL LEVEL	322.41	mm.	U1_RTD028	STATOR CORE 2 TEMPERATURE	58.12		U1_AI021	MAIN SHAFT SEALING	0.008	
U1_AI017	GRAVITY OIL LEVEL	100.55	mm.	U1_RTD029	STATOR CORE 3 TEMPERATURE	61.94		U1_AI028	NO.1 GOV OIL PUMP SOFT START CURRENT FEEDBACK	0.52	
U1_AI018	LUBRICATION OIL LEVEL	311.52	mm.	U1_RTD030	STATOR CORE 4 TEMPERATURE	55.66		U1_AI029	NO.2 GOV OIL PUMP SOFT START CURRENT FEEDBACK	0.21	
U1_AI019	LEAKAGE OIL LEVEL	123.17	mm.	U1_RTD031	STATOR CORE 5 TEMPERATURE	53.19		U1_AI030	NO.1 LUB. OIL PUMP SOFT START CURRENT FEEDBACK	9.14	
GEN.				U1_RTD033	WINDING 1 TEMPERATURE	61.78		U1_AI031	NO.2 LUB. OIL PUMP SOFT START CURRENT FEEDBACK	0.07	
U1_AI033	ACTIVE POWER	4307.82	MW	U1_RTD037	WINDING 5 TEMPERATURE	59.79					
U1_AI037	REACTIVE POWER	0.42	MVAR	U1_RTD039	WINDING 7 TEMPERATURE	55.74					
U1_AI034	GEN VOLTAGE A-B	6842.99	kV	U1_RTD042	WINDING 10 TEMPERATURE	61.70					
U1_AI035	GEN VOLTAGE B-C	6840.32	kV	U1_RTD043	WINDING 11 TEMPERATURE	65.21					
U1_AI036	GEN VOLTAGE C-A	6879.30	kV	U1_RTD044	WINDING 12 TEMPERATURE	65.69					
U1_AI038	GEN CURRENT A	372.46	A	U1_RTD045	THRUST SHOE 1 TEMPERATURE	60.35					
U1_AI039	GEN CURRENT B	356.01	A	U1_RTD046	THRUST SHOE 2 TEMPERATURE	40.27					
U1_AI040	GEN CURRENT C	363.22	A	U1_RTD047	REVERSE 1 TEMPERATURE	55.74					
U1_AI041	FREQUENCY	50.06	Hz	U1_RTD048	REVERSE 2 TEMPERATURE	39.88					
U1_AI042	POWER FACTOR	0.008									
U1_AI027	SHAFT CURRENT	0.008									

GO TO UNIT 2

COMMON

UNIT OPERATE

GOV CONTROL

AVR CONTROL

AUXILIARY STATUS

GOV OIL SYSTEM

ALARM ANNUNCIATOR

TRIP ANNUNCIATOR

GOV PROP VALVE

MACHINE STATUS

AI STATUS

SINGLE LINE

LUB. OIL SYSTEM

WATER SYSTEM

VIBRATION

SYSTEM OVERVIEW

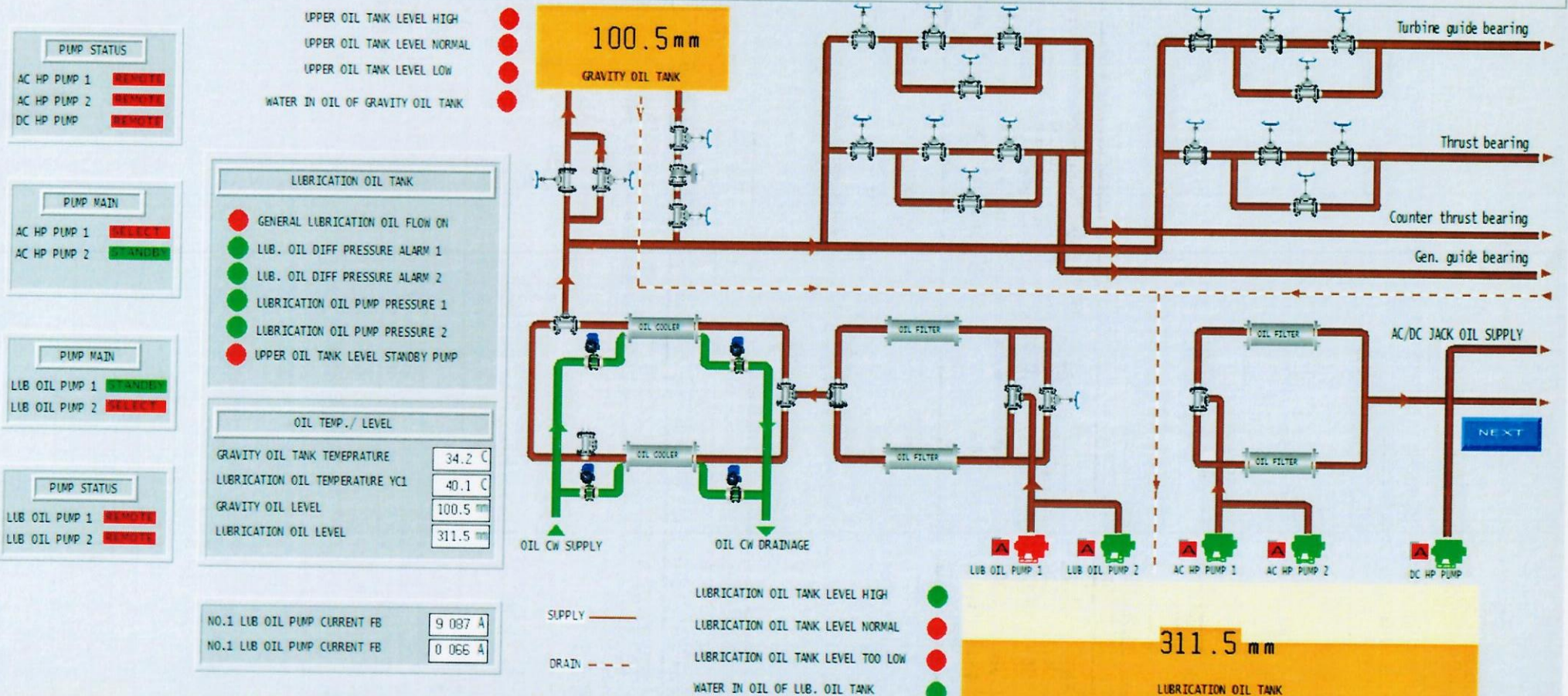
MAINTENANCE



CPD UNIT 1

29/MAY/21 09:12:45

GENERATOR							LINE		TURBINE				WATER LEVEL							
ACTIVE POWER	4274	kW	VOLTAGE <i>ab</i>	6808	V	CURRENT <i>a</i>	372.1	A	LINE VOLTAGE A-B	22641	V	SPEED	125.0	RPM	SPEED	100.0	%	RESERVOIR	12.84	m.MSL
REACTIVE POWER	464.8	KVAR	VOLTAGE <i>bc</i>	6795	V	CURRENT <i>b</i>	355.4	A	LINE VOLTAGE B-C	22809	V	GV POSITION	74.66	%	GATE LIMIT	100.0	%	TAILRACE	5.390	m.MSL
GEN FREQUENCY	50.00	Hz	VOLTAGE <i>ca</i>	6846	V	CURRENT <i>c</i>	363.2	A	LINE VOLTAGE C-A	22620	V	RB POSITION	63.24	%	DISCHARGE FLOW	61.28	m ³ /s	DRAINAGE	723.89	mm.



GO TO UNIT 2

COMMON

UNIT OPERATE
MACHINE STATUS

GOV CONTROL
AI STATUS

AVR CONTROL
SINGLE LINE

AUXILIARY STATUS
LUB. OIL SYSTEM

GOV OIL SYSTEM
WATER SYSTEM

ALARM ANNUNCIATOR
VIBRATION

TRIP ANNUNCIATOR
SYSTEM OVERVIEW

GOV PROP VALVE
MAINTENANCE

29/MAY/21

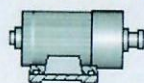
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COMMON AUXILARY

RESERVOIR 13.66 m.MSL

TAILRACE 5.540 m.MSL

COOLING WATER PUMP



PUMP1 PUMP2

Buttons for COOLING WATER PUMP:

- PUMP1: RUN, MAIN, AUTO, START, MANUAL, STOP
- PUMP2: STOP, STAND BY, STOP
- INITIAL ADVANT

LOW PRESS AIR COM

Buttons for LOW PRESS AIR COM:

- AUTO, MANUAL, START, STOP

LOW PRES AIR COM NO.1



Buttons for LOW PRES AIR COM NO.1:

- MAIN, STOP

LOW PRES AIR COM NO.2



Buttons for LOW PRES AIR COM NO.2:

- STAND BY, STOP

EMER DIESEL AUTO SW

Buttons for EMER DIESEL AUTO SW:

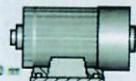
- REMOTE, AUTO, RUN, START, STOP
- AUTO, MANUAL
- NORMAL LINE CB: CLOSE, VOLT NORMAL, START, STOP
- EMERGENCY DIESEL CB: OPEN, NO VOLTAGE, START, STOP

DRAINAGE PUMP

Buttons for DRAINAGE PUMP:

- AUTO, MANUAL, STOP, MAIN, START, STOP
- PUMP1: STOP, MAIN, START, STOP
- PUMP2: STOP, STAND BY, START, STOP

EMERGENCY PUMP



Buttons for EMERGENCY PUMP:

- STOP, REMOTE, AUTO, START, STOP
- AUTO, MANUAL

BUZZER

Buttons for BUZZER:

- TEST, RESET

ALL NO WARNING! EVERYTHING IS OK!

724.09

GO TO UNIT 1

SINGLE LINE

MAIN COM

GO TO UNIT 2



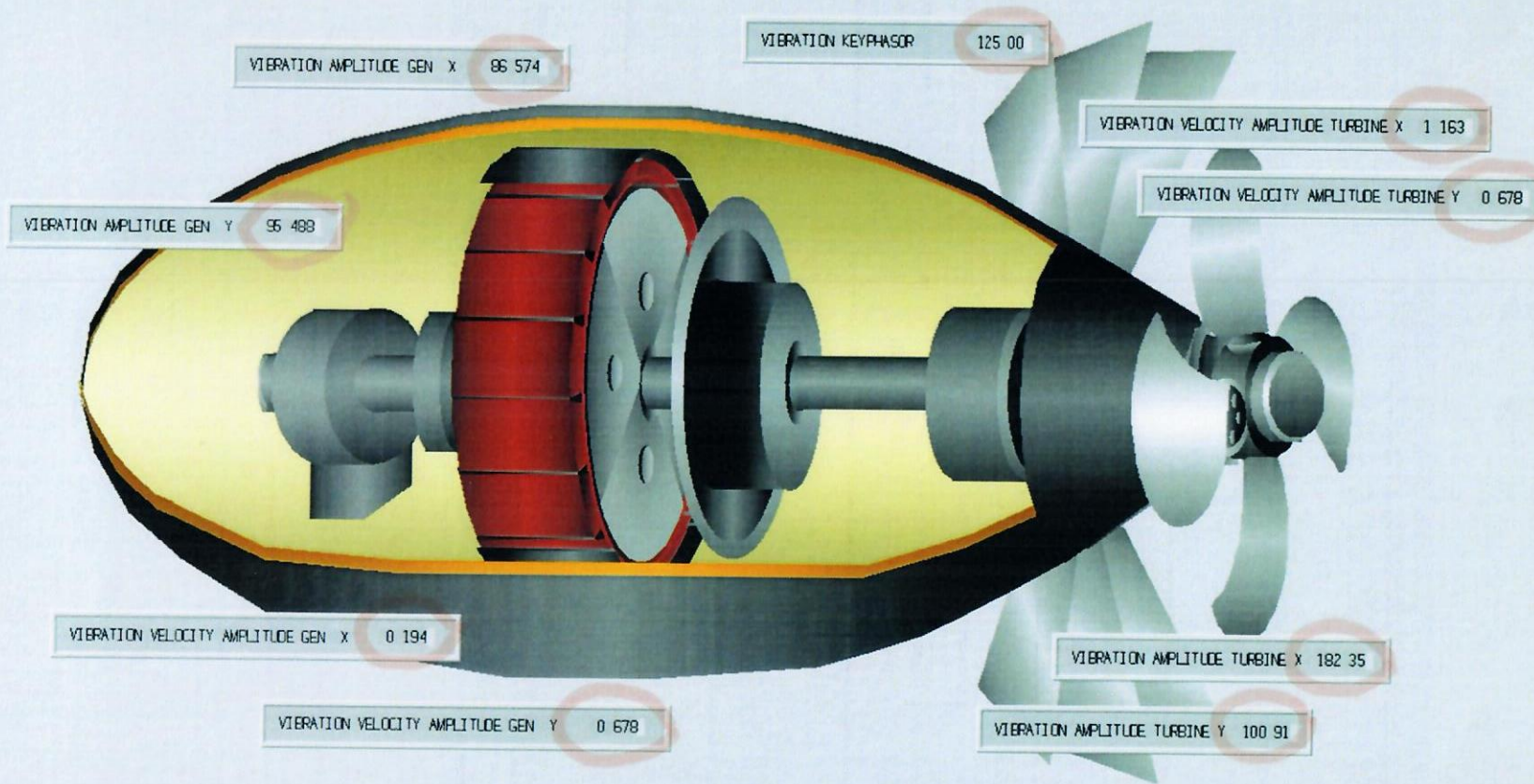
CPD UNIT 1

29/MAY/21 09:05:25

GENERATOR						LINE		TURBINE				WATER LEVEL								
ACTIVE POWER	4271	KW	VOLTAGE <i>ab</i>	6833	V	CURRENT <i>a</i>	370.7	A	LINE VOLTAGE A-B	22698	V	SPEED	125.0	RPM	SPEED	100.0	%	RESERVOIR	12.85	m.MSL
REACTIVE POWER	453.2	KVAR	VOLTAGE <i>bc</i>	6820	V	CURRENT <i>b</i>	353.9	A	LINE VOLTAGE B-C	22869	V	GV POSITION	74.64	%	GATE LIMIT	100.0	%	TAILRACE	5.388	m.MSL
GEN FREQUENCY	50.02	Hz	VOLTAGE <i>ca</i>	6867	V	CURRENT <i>c</i>	360.9	A	LINE VOLTAGE C-A	22680	V	RB POSITION	63.28	%	DISCHARGE FLOW	61.93	m3/s	DRAINAGE	782.49	mm.

VIBRATION STATUS

- VIBRATION SYSTEM OK
- VIBRATION ALARM
- VIBRATION TRIP



GO TO UNIT 2

COMMON

UNIT OPERATE	GOV CONTROL	AVR CONTROL	AUXILIARY STATUS	GOV OIL SYSTEM	ALARM ANNUNCIATOR	TRIP ANNUNCIATOR	GOV PROP VALVE
MACHINE STATUS	AI STATUS	SINGLE LINE	LUB. OIL SYSTEM	WATER SYSTEM	VIBRATION	SYSTEM OVERVIEW	MAINTENANCE