PT. SALIPI NAGARI PERKASA
Komp. Pejaten Mas Blok E No. 3 Kramat Watu Serang - Banten 42161
Telp. : 0254 - 231363 Fax.: 0254 - 231183

LAPORAN UJI MINYAK TRAFO

di

UNIT JASA PEMBANGKIT

JERANJANG

INDONESIA POWER

Yang dilakukan pada tanggal 24 Juli 2018

Untuk keadaan trafo bulan JULI 2018

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1.0 Specific Information:

No.	Unit No.	Serial Number	TC	Test Requested
1.	MAIN TRAFO UNIT 1	1006901	4	Acidity, Dielectric, Color, Visualization and Water Content
2.	TRAFO 1 ESP UNIT 1	10937	5	Acidity, Dielectric, Color, Visualization and Water Content
3.	TRAFO 2 ESP UNIT 1	10035	6	Acidity, Dielectric, Color, Visualization and Water Content
4.	TRAFO 3 ESP UNIT 1	10031	7	Acidity, Dielectric, Color, Visualization and Water Content
5.	TRAFO 4 ESP UNIT 1	10034	8	Acidity, Dielectric, Color, Visualization and Water Content
6.	MAIN TRAFO UNIT 3	1122170	9	Acidity, Dielectric, Color, Visualization and Water Content
7.	UAT 3	1035082	10	Acidity, Dielectric, Color, Visualization and Water Content
8.	TRAFO 1 ESP UNIT 3	007308428	11	Acidity, Dielectric, Color, Visualization and Water Content
9.	TRAFO 2 ESP UNIT 3	0070084208	12	Acidity, Dielectric, Color, Visualization and Water Content
10.	TRAFO 3 ESP UNIT 3	0072084208	13	Acidity, Dielectric, Color, Visualization and Water Content
11.	TRAFO 4 UNIT 3	0071084208	14	Acidity, Dielectric, Color, Visualization and Water Content
12.	ASH HANDLING-1	10820108	15	Acidity, Dielectric, Color, Visualization and Water Content
13.	ASH HANDLING-2	10820107	16	Acidity, Dielectric, Color, Visualization and Water Content
14.	TRAFO 1 ESP UNIT 2	10037	17	Acidity, Dielectric, Color, Visualization and Water Content
15.	TRAFO 2 ESP UNIT 2	10036	18	Acidity, Dielectric, Color, Visualization and Water Content
16.	TRAFO 3 ESP UNIT 2	10033	19	Acidity, Dielectric, Color, Visualization and Water Content
17.	TRAFO 4 ESP UNIT 2	10032	20	Acidity, Dielectric, Color, Visualization and Water Content

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No.	Unit No.	Serial Number	TC	Test Requested
18.	MAIN TRAFO UNIT 2	1006902	21	Acidity, Dielectric, Color, Visualization and Water Content

Note:

* OLTT+ consists of Liquid Screen Tests, Dissolved Gas Analysis (DGA), Water Content, Furan Analysis, Metals-in-Oil Analysis, Liquid Power Factors, and Inhibitor Content (DBPC).

** Liquid Screen Test consists of Acidity, Interfacial Tension (IFT), Dielectric, Colour, Specific Gravity, Visualization, and Sediment.

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2.0 Our Comments and Recommendations of The Test Results Analysis:

We had reviewed each laboratory test result against respective benchmark parameter and following are our comments and recommendations.

No.	Unit No.	Serial Number	TC
1.	MAIN TRAFO UNIT 1	1006901	4

A) Analysis

- **Acidity** of 0.014mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 86kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water Content** in oil of 6ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 0.57% M/dw is graded as **A.** For this transformer, it is recommended to maintain water content in oil at less than 20ppm.

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **MAIN TRAFO UNIT 1**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017	ONLINE		45	NORMAL		GOOD	
31/07/2017	ONLINE	28	28				
30/08/2017	OFFLINE	49	49	NORMAL	FAIR	GOOD	NONE
29/09/2017	OFFLINE	48		NORMAL	FAIR	GOOD	NONE
30/10/2017	ONLINE	60	64	NORMAL	FAIR	GOOD	NONE
27/11/2017	ONLINE		51				
06/12/2017	OFFLINE	50	48				
22/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE	50	55				
24/07/2018	ONLINE					GOOD	

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.017 AC	41.5 AC	58 AC	0.5 AC	0.8691 AC	CLEAR AC	
31/07/2017	ROUTINE	0.017 AC		70 AC	0.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.017 AC		92 AC	0.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.014 AC		82 AC	0.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.014 AC		79 AC	0.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.014 AC		53 AC	0.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.011 AC	40.2 AC	87 AC	0.5 AC	0.8745 AC	CLEAR AC	
22/05/2018	ROUTINE	0.011 AC		77 AC	0.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.014 AC	41.9 AC	69 AC	0.5 AC	0.8716 AC	CLEAR AC	
24/07/2018	ROUTINE	0.014 AC		86 AC	0.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	147	9471	43278	32	655	2728	4	5	ND	843	56320
06/12/2017	183	12895	43794	39	715	3166	5	5	ND	947	60802
28/06/2018	176	11044	46776	41	758	3393	5	6	ND	986	62199

RECOMMENDATION:
NO FURTHER GENERATION OF HYDROGEN IS NOTED. HOWEVER, INCREASING PATTERN OF CARBON OXIDES ARE DETECTED.

NAMEPLATE DATA

MFG	- WOLONG
DATE MFG	- 2011
MAIN TANK S/N	- **100691**
KVA	- 40000
PRI	- 165000 V
SEC	- 6300 V
KILOGRAMS	- 81000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- OFAF
IMPEDENCE	- 13.1%
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 30857
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- YES
H2O COOLED	- NO
OIL PUMPS	- YES
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- YES
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- YES

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	33	10	0.82	A
31/07/2017	26	8	1.04	B
30/08/2017	34	6	0.49	A
29/09/2017	36	8	0.57	A
30/10/2017	44	10	0.45	A
27/11/2017	42	8	0.40	A
06/12/2017	38	7	0.46	A
22/05/2018	30	10	1.05	B
28/06/2018	41	7	0.35	A
24/07/2018	32	6	0.57	A

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **MAIN TRAFO UNIT 1**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	-	WOLONG
DATE MFG	-	2011
MAIN TANK S/N	-	**100691**
KVA	-	40000
PRI	-	165000 V
SEC	-	6300 V
KILOGRAMS	-	81000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	OFAF
IMPEDENCE	-	13.1%
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	30857
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
04/07/2017	0.02	0.01	0.01
06/12/2017	ND	0.01	0.04
28/06/2018	ND	ND	0.04

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	YES
H2O COOLED	-	NO
OIL PUMPS	-	YES
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	YES
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	YES

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	0.140 AC
06/12/2017	0.000 AC	0.040 AC
28/06/2018	0.000 AC	0.140 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.24 AC
06/12/2017	0.27 AC
28/06/2018	0.24 AC

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	3A	MAGENTA
06/12/2017	NON-COR	2C	LAVENDER BLUE
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
2.	TRAFO 1 ESP UNIT 1	10937	5

A) Analysis

- **Acidity** of 0.073mgKOH/g is **QUESTIONABLE**. This indicates further accumulation of contaminants, oxidation products, or both.
- **Dielectric** of 38kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water content** in oil of 19ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 2.00% M/dw is graded as **D.** For this transformer, it is advisable to maintain the water content level below 20ppm. Although the level is acceptable, it is at the borderline of acceptable and questionable range.

B) Recommendation

- Based on previous oil analysis, the IFT of the oil is unfavorable. Together with the high level of Acidity, it is recommended to perform **Transformer Oil Regeneration** on this unit. Transformer oil regeneration at this stage of contamination will effectively remove unwanted oxidation byproducts as well as moisture from the insulating oil. This process will restore the oil back to its original quality, thus protecting the paper insulation and extending the transformer serviceable lifespan. Furthermore, oil inhibitor 2,6-DBPC and passivator will be added to preserve both the transformer oil and copper surfaces to enhance the service ability of the transformer.

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(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 1 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017		36		NORMAL		GOOD	
31/07/2017	OFFLINE	28					
30/08/2017	OFFLINE	30				GOOD	NONE
29/09/2017	OFFLINE	35		NORMAL		GOOD	NONE
30/10/2017	OFFLINE	50		NORMAL		GOOD	NONE
27/11/2017	ONLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.056 QU	25.3 UN	50 AC	1.5 AC	0.8529 AC	CLEAR AC	
31/07/2017	ROUTINE	0.059 QU		57 AC	1.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.056 QU		65 AC	1.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.059 QU		58 AC	1.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.059 QU		23 UN	1.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.062 QU		25 QU	1.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.062 QU	25.0 UN	48 AC	1.5 AC	0.8583 AC	CLEAR AC	
21/05/2018	ROUTINE	0.065 QU		38 AC	1.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.067 QU	25.9 UN	32 AC	1.5 AC	0.8560 AC	CLEAR AC	
24/07/2018	ROUTINE	0.073 QU		38 AC	1.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	35	20494	67487	4	69	1143	ND	1	ND	109	89233
06/12/2017	39	19933	67198	4	83	1261	ND	1	ND	127	88519
28/06/2018	44	20039	64529	4	119	1696	ND	2	ND	169	86433

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10937**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	1000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	26	18	2.34	D
31/07/2017	25	20	2.60	D
30/08/2017	29	18	1.89	D
29/09/2017	32	19	1.80	D
30/10/2017	42	32	1.60	C
27/11/2017	41	33	1.65	C
06/12/2017	30	18	1.89	D
21/05/2018	31	33	3.13	E
28/06/2018	32	30	2.85	E
24/07/2018	29	19	2.00	D

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 1 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	95	ND	ND	ND	95
06/12/2017	ND	75	ND	ND	ND	75
28/06/2018	ND	85	ND	ND	ND	85

RECOMMENDATION:
FURAN ANALYSIS SHOWS DETECTION OF 2FOL WHICH INDICATES THAT THE SOLID INSULATION IS WET. IT IS ADVISABLE TO MAINTAIN THE OIL IN A GOOD CONDITION SO AS NOT TO FURTHER DETERIORATE THE PAPER INSULATION.

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10937**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	- 1000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	ND	0.01	0.01
06/12/2017	ND	ND	ND
28/06/2018	ND	ND	0.03

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	1.870 AC
06/12/2017	0.000 AC	0.570 AC
28/06/2018	0.000 AC	0.680 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	ND UN
06/12/2017	ND UN
28/06/2018	ND UN

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	1B	DARK ORANGE
06/12/2017	NON-COR	1A	LIGHT ORANGE
28/06/2018	NON-COR	1B	DARK ORANGE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
3.	TRAFO 2 ESP UNIT 1	10035	6

A) Analysis

- **Acidity** of 0.062mgKOH/g is **QUESTIONABLE**. This indicates further accumulation of contaminants, oxidation products, or both.
- **Dielectric** of 47kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water content** in oil of 15ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 1.58% M/dw is graded as **C.** For this transformer, it is advisable to maintain the water content level below 20ppm.

B) Recommendation

- Based on previous oil analysis, the IFT of the oil is unfavorable. Together with the high level of Acidity, it is recommended to perform **Transformer Oil Regeneration** on this unit. Transformer oil regeneration at this stage of contamination will effectively remove unwanted oxidation byproducts. This process will restore the oil back to its original quality, thus protecting the paper insulation and extending the transformer serviceable lifespan. Furthermore, oil inhibitor 2,6-DBPC and passivator will be added to preserve both the transformer oil and copper surfaces to enhance the service ability of the transformer.

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DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 2 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017		37		NORMAL		GOOD	
31/07/2017	OFFLINE						
30/08/2017	OFFLINE	39		NORMAL	FAIR	GOOD	NONE
29/09/2017	OFFLINE	40		NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE	44		NORMAL	FAIR	GOOD	NONE
27/11/2017	ONLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			LOW		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.042 AC	26.6 UN	41 AC	1.5 AC	0.8540 AC	CLEAR AC	
31/07/2017	ROUTINE	0.045 AC		25 QU	1.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.042 AC		42 AC	1.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.048 AC		59 AC	1.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.051 QU		62 AC	1.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.051 QU		50 AC	1.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.053 QU	27.3 UN	51 AC	1.5 AC	0.8589 AC	CLEAR AC	
21/05/2018	ROUTINE	0.056 QU		45 AC	1.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.059 QU	27.6 UN	55 AC	1.5 AC	0.8570 AC	CLEAR AC	
24/07/2018	ROUTINE	0.062 QU		47 AC	1.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	27	18639	66781	3	64	1106	ND	1	ND	95	86621
06/12/2017	20	19360	61590	3	45	728	ND	1	ND	69	81747
28/06/2018	22	22494	64443	4	57	789	ND	ND	ND	83	87809

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10035**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	- 1000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	27	21	2.48	D
31/07/2017	24	27	3.91	E
30/08/2017	28	14	1.65	C
29/09/2017	31	19	1.80	D
30/10/2017	35	17	1.21	B
27/11/2017	35	18	1.28	B
06/12/2017	30	17	1.78	D
21/05/2018	31	20	1.90	D
28/06/2018	32	17	1.62	C
24/07/2018	30	15	1.58	C

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 2 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	62	ND	ND	ND	62
06/12/2017	ND	67	ND	ND	ND	67
28/06/2018	ND	84	ND	ND	ND	84

RECOMMENDATION:
FURAN ANALYSIS SHOWS DETECTION OF 2FOL WHICH INDICATES THAT THE SOLID INSULATION IS WET. IT IS ADVISABLE TO MAINTAIN THE OIL IN A GOOD CONDITION SO AS NOT TO FURTHER DETERIORATE THE PAPER INSULATION.

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	ND	0.01	ND
06/12/2017	ND	ND	0.02
28/06/2018	ND	ND	0.02

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10035**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	1000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	1.900 AC
06/12/2017	0.000 AC	0.980 AC
28/06/2018	0.000 AC	1.310 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.02 UN
06/12/2017	0.02 UN
28/06/2018	ND UN

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	1A	LIGHT ORANGE
06/12/2017	NON-COR	1B	DARK ORANGE
28/06/2018	NON-COR	1B	DARK ORANGE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
4.	TRAFO 3 ESP UNIT 1	10031	7

A) Analysis

- **Acidity** of 0.051mgKOH/gm is **QUESTIONABLE**. The levels remained stable without further oil degradation. Stabilized condition may proceed with annual monitoring.
- **Dielectric** of 64kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water content** in oil of 17ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 1.78% M/dw is graded as **D.** For this transformer, it is advisable to maintain the water content level below 20ppm.

B) Recommendation

- Do carry-out *Liquid Screen, Liquid Power Factor, Inhibitor, Water Content, Metals-In-Oil, Furan Analysis & DGA periodically for **Condition Monitoring purposes**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 3 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017		28		NORMAL		GOOD	
31/07/2017	ONLINE						
30/08/2017	OFFLINE	35		NORMAL	FAIR	GOOD	NONE
29/09/2017	OFFLINE	38		NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE	44		NORMAL	FAIR	GOOD	NONE
27/11/2017	ONLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.048 AC	28.4 QU	44 AC	1.0 AC	0.8537 AC	CLEAR AC	
31/07/2017	ROUTINE	0.042 AC		77 AC	1.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.042 AC		61 AC	1.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.045 AC		72 AC	1.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.048 AC		72 AC	1.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.051 QU		62 AC	1.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.053 QU	28.3 QU	57 AC	1.5 AC	0.8624 AC	CLEAR AC	
21/05/2018	ROUTINE	0.056 QU		48 AC	1.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.053 QU	29.7 QU	62 AC	1.5 AC	0.8605 AC	CLEAR AC	
24/07/2018	ROUTINE	0.051 QU		64 AC	1.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	32	15273	65111	5	95	1002	ND	2	ND	134	81520
06/12/2017	7	14730	65738	3	42	617	ND	ND	ND	52	81137
28/06/2018	9	17958	66007	4	46	781	ND	1	ND	60	84806

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10031**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	- 1000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	25	32	4.16	E
31/07/2017	25	16	2.08	D
30/08/2017	30	13	1.37	C
29/09/2017	32	14	1.33	B
30/10/2017	37	16	1.04	B
27/11/2017	34	17	1.39	C
06/12/2017	30	16	1.68	C
21/05/2018	31	21	2.00	D
28/06/2018	30	17	1.78	D
24/07/2018	30	17	1.78	D

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 3 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	32	ND	ND	ND	32
06/12/2017	ND	14	ND	ND	ND	14
28/06/2018	ND	20	ND	ND	ND	20

RECOMMENDATION:
FURAN ANALYSIS SHOWS MINOR DETECTION OF FURANIC COMPOUNDS. THIS IS IN LINE WITH A HEALTHY SOLID INSULATION.

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
04/07/2017	0.01	0.01	0.01
06/12/2017	ND	ND	ND
28/06/2018	ND	ND	0.11

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10031**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	1000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	1.700 AC
06/12/2017	0.000 AC	0.630 AC
28/06/2018	0.000 AC	1.030 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.01 UN
06/12/2017	0.01 UN
28/06/2018	ND UN

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	1A	LIGHT ORANGE
06/12/2017	NON-COR	2C	LAVENDER BLUE
28/06/2018	NON-COR	1B	DARK ORANGE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
5.	TRAFO 4 ESP UNIT 1	10034	8

A) Analysis

- **Acidity** of 0.039mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 50kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water content** in oil of 19ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 1.80% M/dw is graded as **D.** For this transformer, it is advisable to maintain the water content level below 20ppm. Although the level is acceptable, it is at the borderline of acceptable and questionable range.

B) Recommendation

- Based on previous oil analysis, the IFT of the oil is unfavorable. It is recommended to perform **Transformer Oil Regeneration** on this unit. Transformer oil regeneration at this stage of contamination will effectively remove unwanted oxidation byproducts as well as moisture from the insulating oil. This process will restore the oil back to its original quality, thus protecting the paper insulation and extending the transformer serviceable lifespan. Furthermore, oil inhibitor 2,6-DBPC and passivator will be added to preserve both the transformer oil and copper surfaces to enhance the service ability of the transformer.

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 4 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017		28		NORMAL		BAD	
31/07/2017	ONLINE						
30/08/2017	OFFLINE	34		NORMAL	FAIR	GOOD	NONE
29/09/2017	OFFLINE	40		NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE	44		NORMAL	FAIR	GOOD	NONE
27/11/2017	ONLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			LOW	FAIR	GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.028 AC	26.3 UN	24 UN	1.5 AC	0.8596 AC	CLEAR AC	
31/07/2017	ROUTINE	0.022 AC		88 AC	1.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.028 AC		44 AC	1.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.031 AC		53 AC	1.0 AC		CLEAR AC	
30/10/2017	ROUTINE	0.028 AC		48 AC	1.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.034 AC		41 AC	1.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.031 AC	27.2 UN	41 AC	1.5 AC	0.8645 AC	CLEAR AC	
21/05/2018	ROUTINE	0.034 AC		37 AC	1.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.037 AC	27.5 UN	55 AC	1.5 AC	0.8635 AC	CLEAR AC	
24/07/2018	ROUTINE	0.039 AC		50 AC	1.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	13	12265	66770	5	172	1206	ND	8	ND	198	80439
06/12/2017	8	13331	63527	3	70	720	ND	1	ND	82	77660
28/06/2018	9	17962	64248	4	75	1054	ND	2	ND	90	83354

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10034**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	- 1000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	26	29	3.77	E
31/07/2017	26	15	1.95	D
30/08/2017	30	13	1.37	C
29/09/2017	33	15	1.23	B
30/10/2017	39	18	0.99	B
27/11/2017	37	30	1.95	D
06/12/2017	30	18	1.89	D
21/05/2018	31	23	2.18	D
28/06/2018	30	20	2.10	D
24/07/2018	31	19	1.80	D

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 4 ESP UNIT 1**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	18	ND	ND	ND	18
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	21	ND	ND	ND	21

RECOMMENDATION:
FURAN ANALYSIS SHOWS MINOR DETECTION OF FURANIC COMPOUNDS. THIS IS IN LINE WITH A HEALTHY SOLID INSULATION.

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
04/07/2017	0.05	0.02	0.01
06/12/2017	ND	ND	0.02
28/06/2018	ND	ND	0.05

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10034**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	1000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.180 QU	6.680 UN
06/12/2017	0.010 AC	2.180 AC
28/06/2018	0.060 AC	2.850 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.08 UN
06/12/2017	0.06 UN
28/06/2018	0.02 UN

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	2C	LAVENDER BLUE
06/12/2017	NON-COR	2C	LAVENDER BLUE
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
6.	MAIN TRAFO UNIT 3	1122170	9

A) Analysis

- **Acidity** of 0.014mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 77kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water Content** in oil of 8ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 0.66% M/dw is graded as **A.** For this transformer, it is recommended to maintain water content in oil at less than 20ppm**.**

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **MAIN TRAFO UNIT 3**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017	ONLINE	46	56			GOOD	
31/07/2017	ONLINE	48	50				
30/08/2017	ONLINE	55	60	NORMAL	FAIR	GOOD	NONE
29/09/2017	ONLINE	58	68	NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE	32	32	NORMAL	FAIR	GOOD	NONE
27/11/2017	ONLINE	46	50				
06/12/2017	ONLINE	57	48				
22/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE	48	50	NORMAL			
24/07/2018	ONLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.017 AC	42.3 AC	78 AC	0.5 AC	0.8780 AC	CLEAR AC	
31/07/2017	ROUTINE	0.014 AC		77 AC	0.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.017 AC		86 AC	0.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.014 AC		86 AC	0.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.014 AC		88 AC	0.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.014 AC		87 AC	0.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.014 AC	41.5 AC	84 AC	0.5 AC	0.8832 AC	CLEAR AC	
22/05/2018	ROUTINE	0.014 AC		58 AC	0.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.014 AC	41.0 AC	85 AC	0.5 AC	0.8805 AC	CLEAR AC	
24/07/2018	ROUTINE	0.014 AC		77 AC	0.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	24	10131	44084	11	641	2250	1	1	ND	678	57143
06/12/2017	39	14023	43226	11	668	2456	ND	1	ND	719	60424
28/06/2018	18	11431	48283	13	700	2512	1	1	ND	733	62959

RECOMMENDATION:
CARBON MONOXIDE AND CARBON DIOXIDE LEVEL ARE HIGH. OTHER GASES LEVELS ARE ASSESSED AS ACCEPTABLE.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	33	15	1.23	B
31/07/2017	35	17	1.21	B
30/08/2017	35	8	0.57	A
29/09/2017	42	10	0.50	A
30/10/2017	28	9	1.06	B
27/11/2017	35	8	0.57	A
06/12/2017	37	9	0.58	A
22/05/2018	31	11	1.04	B
28/06/2018	36	8	0.57	A
24/07/2018	33	8	0.66	A

NAMEPLATE DATA

MFG	- SHANDONG
DATE MFG	- 2010
MAIN TANK S/N	- **1122170**
KVA	- 40000
PRI	- 165000 V
SEC	- 6300 V
KILOGRAMS	- 73920
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAF
IMPEDENCE	- 13.79%
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 26708
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- YES
H2O COOLED	- NO
OIL PUMPS	- YES
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- YES
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- YES

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **MAIN TRAFO UNIT 3**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	-	SHANDONG
DATE MFG	-	2010
MAIN TANK S/N	-	**1122170**
KVA	-	40000
PRI	-	165000 V
SEC	-	6300 V
KILOGRAMS	-	73920
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAF
IMPEDENCE	-	13.79%
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	26708
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	0.01	0.01	0.02
06/12/2017	0.01	ND	0.03
28/06/2018	ND	0.01	0.06

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	YES
H2O COOLED	-	NO
OIL PUMPS	-	YES
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	YES
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	YES

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	0.130 AC
06/12/2017	0.000 AC	0.070 AC
28/06/2018	0.000 AC	0.110 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.22 AC
06/12/2017	0.22 AC
28/06/2018	0.19 QU

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	3A	MAGENTA
06/12/2017	NON-COR	2C	LAVENDER BLUE
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
7.	UAT 3	1035082	10

A) Analysis

- **Acidity** of 0.020mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 76kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water Content** in oil of 11ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 1.04% M/dw is graded as **A.** For this transformer, it is recommended to maintain water content in oil at less than 30ppm.

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **UAT 3**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017	ONLINE		55			BAD	
31/07/2017	ONLINE						
30/08/2017	ONLINE		58	NORMAL	FAIR	GOOD	NONE
29/09/2017	ONLINE		58	NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE		44	NORMAL	FAIR	GOOD	NONE
27/11/2017	ONLINE		60				
06/12/2017	ONLINE		60				
22/05/2018	ONLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE		50				
24/07/2018	ONLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.022 AC	38.1 AC	60 AC	0.5 AC	0.8767 AC	CLEAR AC	
31/07/2017	ROUTINE	0.025 AC		88 AC	0.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.022 AC		89 AC	0.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.020 AC		80 AC	0.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.022 AC		86 AC	0.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.022 AC		86 AC	0.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.020 AC	37.6 AC	86 AC	0.5 AC	0.8820 AC	CLEAR AC	
22/05/2018	ROUTINE	0.020 AC		81 AC	0.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.022 AC	37.5 AC	79 AC	0.5 AC	0.8793 AC	CLEAR AC	
24/07/2018	ROUTINE	0.020 AC		76 AC	0.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	20	16028	68308	20	971	3536	5	7	ND	1023	88895
06/12/2017	36	18752	66758	19	1116	3622	5	7	ND	1183	90315
28/06/2018	35	13798	68160	22	1144	3644	5	7	1	1214	86816

RECOMMENDATION:
RETEST 6 MONTHS: THE DETECTION OF ACETYLENE IS SOME CAUSE FOR CONCERN. CLOSE MONITORING IS NEEDED TO DIAGNOSE THE FAULT

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	33	11	0.90	A
31/07/2017	32	14	1.33	B
30/08/2017	35	11	0.78	A
29/09/2017	37	12	0.78	A
30/10/2017	29	11	1.15	A
27/11/2017	37	12	0.78	A
06/12/2017	39	12	0.66	A
22/05/2018	29	14	1.47	B
28/06/2018	33	10	0.82	A
24/07/2018	32	11	1.04	A

NAMEPLATE DATA

MFG	- SHANDONG
DATE MFG	- 2010
MAIN TANK S/N	- **1035082**
KVA	- 6300
PRI	- 6300 V
SEC	- 6300 V
KILOGRAMS	- 14600
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	- 5.78%
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 3749
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- YES

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **UAT 3**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	-	SHANDONG
DATE MFG	-	2010
MAIN TANK S/N	-	**1035082**
KVA	-	6300
PRI	-	6300 V
SEC	-	6300 V
KILOGRAMS	-	14600
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	5.78%
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	3749
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	0.02	0.01	0.04
06/12/2017	ND	0.01	0.08
28/06/2018	ND	0.01	0.11

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	YES

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	0.390 AC
06/12/2017	0.000 AC	0.170 AC
28/06/2018	0.000 AC	0.140 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.23 AC
06/12/2017	0.23 AC
28/06/2018	0.21 AC

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	3A	MAGENTA
06/12/2017	NON-COR	2C	LAVENDER BLUE
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
8.	TRAFO 1 ESP UNIT 3	007308428	11

A) Analysis

- **Acidity** of 0.020mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 53kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water content** in oil of 9ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 1.17% M/dw is graded as **B.** For this transformer, it is advisable to maintain the water content level below 20ppm.

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes**.

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 1 ESP UNIT 3**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
31/07/2017	ONLINE						
30/08/2017	ONLINE			NORMAL	FAIR	GOOD	NONE
29/09/2017	ONLINE			NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE			NORMAL	FAIR	GOOD	NONE
28/11/2017	ONLINE						
06/12/2017	ONLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	OFFLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.022 AC	23.2 UN	32 AC	1.5 AC	0.8432 AC	CLEAR AC	
31/07/2017	ROUTINE	0.028 AC		47 AC	1.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.028 AC		36 AC	1.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.025 AC		45 AC	1.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.025 AC		40 AC	1.5 AC		CLEAR AC	
28/11/2017	ROUTINE	0.025 AC		31 AC	1.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.022 AC	34.6 AC	31 AC	1.5 AC	0.8180 QU	CLEAR AC	
21/05/2018	ROUTINE	0.022 AC		31 AC	0.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.022 AC	35.0 AC	60 AC	0.5 AC	0.8154 QU	CLEAR AC	
24/07/2018	ROUTINE	0.020 AC		53 AC	0.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	14	12943	68807	3	62	1243	ND	ND	ND	79	83072
06/12/2017	14	12739	65097	3	66	612	ND	ND	ND	83	78531
28/06/2018	19	15552	64448	3	57	1391	ND	ND	ND	79	81470

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	36	26	1.85	D
31/07/2017	31	21	2.00	D
30/08/2017	30	22	2.31	D
29/09/2017	34	20	1.64	C
30/10/2017	28	19	2.24	D
28/11/2017	43	34	1.53	C
06/12/2017	43	31	1.39	C
21/05/2018	31	27	2.57	D
28/06/2018	32	10	0.95	B
24/07/2018	26	9	1.17	B

NAMEPLATE DATA

MFG	- ZHEJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **0073084208**
KVA	-
PRI	- 72000 V
SEC	- 416 V
KILOGRAMS	- 1350
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 731
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- NO
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- YES

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 1 ESP UNIT 3**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	-	ZHEJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**0073084208**
KVA	-	
PRI	-	72000 V
SEC	-	416 V
KILOGRAMS	-	1350
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	731
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	0.01	0.01	ND
06/12/2017	0.01	ND	ND
28/06/2018	ND	ND	0.02

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	NO
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	YES

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	0.350 AC
06/12/2017	0.000 AC	0.040 AC
28/06/2018	0.000 AC	0.050 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	ND UN
06/12/2017	0.18 QU
28/06/2018	0.16 QU

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	1B	DARK ORANGE
06/12/2017	NON-COR	2E	BRASSY GOLD
28/06/2018	NON-COR	1B	DARK ORANGE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
9.	TRAFO 2 ESP UNIT 3	0070084208	12

A) Analysis

- **Acidity** of 0.22mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 30kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water Content** in oil of 25ppm is **UNACCEPTABLE**. Meanwhile Water Content in solid insulation of 2.38% M/dw is graded as **D.** For this transformer, it is recommended to maintain water content in oil at less than 20ppm**.** This indicates the presence of high water content in the oil. The presence of high water content could cause dielectric failure.

B) Recommendation

- Based on previous oil analysis, the Specific Gravity of the oil needs further investigation. Should the unit is safe to operate with the current oil-filled, highly recommended to perform **OIL Regeneration**. Transformer oil regeneration at this stage of contamination will effectively remove unwanted oxidation byproducts as well as excess moisture from the insulating oil. This process will restore the oil back to its original quality, thus protecting the paper insulation and extending the transformer serviceable lifespan. Furthermore, passivator will be added to preserve both the transformer oil and copper surfaces to enhance the service ability of the transformer.

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 2 ESP UNIT 3**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
30/08/2017	OFFLINE			NORMAL	FAIR	GOOD	NONE
29/09/2017	ONLINE			NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE			NORMAL	FAIR	GOOD	NONE
28/11/2017	ONLINE						
06/12/2017	ONLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	OFFLINE						
24/07/2018	ONLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.118 UN	16.2 UN	24 UN	3.0 AC	0.8435 AC	CLEAR AC	
31/07/2017	ROUTINE	0.112 UN		28 QU	3.0 AC		CLEAR AC	
30/08/2017	ROUTINE	0.109 UN		34 AC	2.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.115 UN		21 UN	2.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.118 UN		33 AC	2.5 AC		CLEAR AC	
28/11/2017	ROUTINE	0.017 AC		25 QU	0.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.022 AC	29.7 QU	29 QU	0.5 AC	0.8106 QU	CLEAR AC	
21/05/2018	ROUTINE	0.022 AC		28 QU	0.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.025 AC	30.2 QU	34 AC	0.5 AC	0.8080 QU	CLEAR AC	
24/07/2018	ROUTINE	0.022 AC		30 AC	0.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	38	16781	70523	5	129	2431	3	5	ND	180	89915
06/12/2017	42	19523	66059	3	102	912	ND	ND	ND	147	86641
28/06/2018	43	22272	68719	4	38	1226	ND	ND	ND	85	92302

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	37	39	2.54	D
31/07/2017	31	38	3.61	E
30/08/2017	26	17	2.21	D
29/09/2017	36	37	2.63	D
30/10/2017	28	20	2.36	D
28/11/2017	43	28	1.26	B
06/12/2017	43	44	1.98	D
21/05/2018	31	30	2.85	E
28/06/2018	30	16	1.68	C
24/07/2018	32	25	2.38	D

NAMEPLATE DATA

MFG	-	ZHEJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**0070084208**
KVA	-	
PRI	-	72000 V
SEC	-	415 V
KILOGRAMS	-	1350
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	731
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 2 ESP UNIT 3**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	169	ND	ND	169
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	-	ZHEJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**0070084208**
KVA	-	
PRI	-	72000 V
SEC	-	415 V
KILOGRAMS	-	1350
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	731
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	ND	0.01	0.01
06/12/2017	ND	ND	ND
28/06/2018	ND	ND	0.02

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	1.330 AC
06/12/2017	0.000 AC	0.030 AC
28/06/2018	0.000 AC	0.040 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	ND UN
06/12/2017	0.20 AC
28/06/2018	0.19 QU

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	2C	LAVENDER BLUE
06/12/2017	NON-COR	3A	MAGENTA
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
10.	TRAFO 3 ESP UNIT 3	0072084208	13

A) Analysis

- **Acidity** of 0.014mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 43kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water content** in oil of 20ppm is **QUESTIONABLE**. Meanwhile Water Content in solid insulation of 1.64% M/dw is graded as **C.** For this transformer, it is advisable to maintain the water content level below 20ppm. This indicates the presence of high water content in the oil.

B) Recommendation

- Based on previous oil analysis, the Specific Gravity of the oil needs further investigation. Should the unit is safe to operate with the current oil-filled, highly recommended to perform **OIL PURIFICATION**. Result indicates that the moisture content in the transformer oil is not conducive for normal operation of a transformer. Oil purification will remove excessive moisture detected in the transformer oil and thus improving dielectric breakdown voltage of the mineral oil. Furthermore, passivator will be added to preserve both the transformer oil and copper surfaces to enhance the service ability of the transformer.

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 3 ESP UNIT 3**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017	ONLINE						
31/07/2017	ONLINE						
30/08/2017	ONLINE			NORMAL	FAIR	GOOD	NONE
29/09/2017	ONLINE			NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE			LOW	FAIR	GOOD	NONE
28/11/2017	ONLINE						
06/12/2017	ONLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	ONLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.025 AC	27.8 UN	40 AC	1.5 AC	0.8415 AC	CLEAR AC	
31/07/2017	ROUTINE	0.025 AC		66 AC	1.5 AC		CLEAR AC	
30/08/2017	ROUTINE	0.025 AC		50 AC	1.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.028 AC		59 AC	1.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.028 AC		55 AC	1.5 AC		CLEAR AC	
28/11/2017	ROUTINE	0.014 AC		39 AC	0.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.014 AC	39.8 AC	45 AC	0.5 AC	0.8099 QU	CLEAR AC	
21/05/2018	ROUTINE	0.014 AC		54 AC	0.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.017 AC	38.4 AC	43 AC	0.5 AC	0.8075 QU	CLEAR AC	
24/07/2018	ROUTINE	0.014 AC		43 AC	0.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	21	16364	70694	3	38	1068	ND	ND	ND	62	88188
06/12/2017	15	14515	65277	2	40	559	ND	ND	ND	57	80408
28/06/2018	30	15202	64188	4	65	1833	ND	ND	ND	99	81322

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	37	27	1.75	D
31/07/2017	29	18	1.89	D
30/08/2017	35	21	1.49	C
29/09/2017	37	22	1.43	C
30/10/2017	28	16	1.89	D
28/11/2017	44	24	1.08	B
06/12/2017	44	29	1.30	B
21/05/2018	32	23	2.18	D
28/06/2018	35	22	1.56	C
24/07/2018	34	20	1.64	C

NAMEPLATE DATA

MFG	- ZHEJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **0072084208**
KVA	-
PRI	- 72000 V
SEC	- 415 V
KILOGRAMS	- 1350
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 731
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 3 ESP UNIT 3**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	4	ND	ND	ND	4

RECOMMENDATION:
FURAN ANALYSIS SHOWS MINOR DETECTION OF FURANIC COMPOUNDS. THIS IS IN LINE WITH A HEALTHY SOLID INSULATION.

NAMEPLATE DATA

MFG	- ZHEJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **0072084208**
KVA	-
PRI	- 72000 V
SEC	- 415 V
KILOGRAMS	- 1350
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 731
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
04/07/2017	ND	0.01	ND
06/12/2017	ND	ND	ND
28/06/2018	ND	ND	0.02

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	0.620 AC
06/12/2017	0.000 AC	0.080 AC
28/06/2018	0.000 AC	0.010 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.01 UN
06/12/2017	0.21 AC
28/06/2018	0.20 AC

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	2C	LAVENDER BLUE
06/12/2017	NON-COR	2E	BRASSY GOLD
28/06/2018	NON-COR	2E	BRASSY GOLD

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
11.	TRAFO 4 UNIT 3	0071084208	14

A) Analysis

- **Acidity** of 0.22mgKOH/g is **ACCEPTABLE.**
- **Dielectric** of 42kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water content** in oil of 11ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 1.43% M/dw is graded as **D.** For this transformer, it is advisable to maintain the water content level below 20ppm.

B) Recommendation

- Do carry-out *Liquid Screen, Liquid Power Factor, Inhibitor, Water Content, Metals-In-Oil, Furan Analysis & DGA periodically for **Condition Monitoring purposes**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 4 UNIT 3**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
30/08/2017	OFFLINE			NORMAL	FAIR	GOOD	NONE
29/09/2017	OFFLINE			NORMAL	FAIR	GOOD	NONE
30/10/2017	OFFLINE			NORMAL	FAIR	GOOD	NONE
28/11/2017	OFFLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.020 AC	31.2 QU	62 AC	1.0 AC	0.8420 AC	CLEAR AC	
04/07/2017	ROUTINE	0.022 AC		60 AC	1.0 AC		CLEAR AC	
30/08/2017	ROUTINE	0.020 AC		55 AC	1.0 AC		CLEAR AC	
29/09/2017	ROUTINE	0.022 AC		59 AC	1.0 AC		CLEAR AC	
30/10/2017	ROUTINE	0.025 AC		55 AC	1.0 AC		CLEAR AC	
28/11/2017	ROUTINE	0.022 AC		69 AC	1.0 AC		CLEAR AC	
06/12/2017	ROUTINE	0.025 AC	29.8 QU	43 AC	1.0 AC	0.8471 AC	CLEAR AC	
21/05/2018	ROUTINE	0.028 AC		37 AC	1.0 AC		CLEAR AC	
28/06/2018	ROUTINE	0.025 AC	30.5 QU	71 AC	1.0 AC	0.8442 AC	CLEAR AC	
24/07/2018	ROUTINE	0.022 AC		42 AC	1.0 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	10	18669	66036	3	24	665	ND	ND	ND	37	85407
06/12/2017	14	15414	63712	2	22	675	ND	ND	ND	38	79839
28/06/2018	20	14690	67822	2	22	683	ND	ND	ND	44	83239

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	32	19	1.80	D
04/07/2017	31	15	1.42	C
30/08/2017	27	17	2.01	D
29/09/2017	29	15	1.58	C
30/10/2017	28	15	1.77	D
28/11/2017	29	16	1.68	C
06/12/2017	32	19	1.80	D
21/05/2018	30	21	2.20	D
28/06/2018	36	11	0.78	A
24/07/2018	26	11	1.43	C

NAMEPLATE DATA

MFG	-	ZHEJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**0071084208**
KVA	-	
PRI	-	72000 V
SEC	-	415 V
KILOGRAMS	-	1350
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	731
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 4 UNIT 3**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	-	ZHEJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**0071084208**
KVA	-	
PRI	-	72000 V
SEC	-	415 V
KILOGRAMS	-	1350
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	731
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	ND	ND	ND
06/12/2017	ND	0.03	ND
28/06/2018	ND	0.03	0.02

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	1.360 AC
06/12/2017	0.000 AC	0.370 AC
28/06/2018	0.000 AC	0.550 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.01 UN
06/12/2017	0.03 UN
28/06/2018	ND UN

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	3A	MAGENTA
06/12/2017	NON-COR	1B	DARK ORANGE
28/06/2018	NON-COR	1B	DARK ORANGE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
12.	ASH HANDLING-1	10820108	15

A) Analysis

- **Acidity** of 0.022mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 39kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water Content** in oil of 20ppm is **ACCEPTABLE**. Meanwhile Water Content in solid insulation of 1.90% M/dw is graded as **B.** For this transformer, it is recommended to maintain water content in oil at less than 30ppm.

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **ASH HANDLING-1**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017	ONLINE	46					
31/07/2017	ONLINE						
30/08/2017	OFFLINE	30		NORMAL	FAIR		NONE
29/09/2017	OFFLINE	40		NORMAL	FAIR		NONE
30/10/2017	ONLINE	45		NORMAL	FAIR		NONE
27/11/2017	ONLINE	46					
06/12/2017	ONLINE	52					
22/05/2018	ONLINE	45		NORMAL		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	ONLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.022 AC	38.1 AC	38 AC	1.0 AC	0.8779 AC	CLEAR AC	
31/07/2017	ROUTINE	0.025 AC		56 AC	1.0 AC		CLEAR AC	
30/08/2017	ROUTINE	0.022 AC		53 AC	1.0 AC		CLEAR AC	
29/09/2017	ROUTINE	0.022 AC		57 AC	1.0 AC		CLEAR AC	
30/10/2017	ROUTINE	0.022 AC		45 AC	1.0 AC		CLEAR AC	
27/11/2017	ROUTINE	0.020 AC		36 AC	1.0 AC		CLEAR AC	
06/12/2017	ROUTINE	0.017 AC	37.5 AC	34 AC	1.0 AC	0.8832 AC	CLEAR AC	
22/05/2018	ROUTINE	0.022 AC		33 AC	1.0 AC		CLEAR AC	
28/06/2018	ROUTINE	0.025 AC	37.5 AC	42 AC	1.0 AC	0.8804 AC	CLEAR AC	
24/07/2018	ROUTINE	0.022 AC		39 AC	1.0 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	35	10984	71058	20	441	5037	7	8	ND	511	87590
06/12/2017	49	12034	67124	20	558	5440	8	8	ND	643	85241
28/06/2018	53	10939	69394	20	557	5425	9	8	ND	647	86405

RECOMMENDATION:
GAS LEVELS HAVE REMAINED STABLE. PROCEED WITH ANNUAL MONITORING.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	34	28	2.30	C
31/07/2017	26	21	2.73	D
30/08/2017	28	16	1.89	B
29/09/2017	34	16	1.31	B
30/10/2017	33	20	1.64	B
27/11/2017	36	29	2.06	C
06/12/2017	36	26	1.85	B
22/05/2018	33	26	2.13	C
28/06/2018	32	24	2.28	C
24/07/2018	32	20	1.90	B

NAMEPLATE DATA

MFG	- WOLONG
DATE MFG	- 2011
MAIN TANK S/N	- **10820108**
KVA	- 1600
PRI	- 6300 V
SEC	- 400 V
KILOGRAMS	- 4505
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	- 5.56%
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 1023
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- YES

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **ASH HANDLING-1**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	- WOLONG
DATE MFG	- 2011
MAIN TANK S/N	- **10820108**
KVA	- 1600
PRI	- 6300 V
SEC	- 400 V
KILOGRAMS	- 4505
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	- 5.56%
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 1023
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
04/07/2017	ND	0.01	0.01
06/12/2017	ND	ND	0.01
28/06/2018	ND	0.01	0.04

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- YES

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	0.730 AC
06/12/2017	0.000 AC	0.240 AC
28/06/2018	0.000 AC	0.460 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.23 AC
06/12/2017	0.24 AC
28/06/2018	0.22 AC

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	1B	DARK ORANGE
06/12/2017	NON-COR	2C	LAVENDER BLUE
28/06/2018	NON-COR	1B	DARK ORANGE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
13.	ASH HANDLING-2	10820107	16

A) Analysis

- **Acidity** of 0.020mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 27kV is **QUESTIONABLE**. This is reflected from the high moisture content detected in the transformer oil.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water Content** in oil of 30ppm is **QUESTIONABLE**. Meanwhile Water Content in solid insulation of 2.46% M/dw is graded as **C.** For this transformer, it is recommended to maintain water content in oil at less than 30ppm. This indicates the presence of high water content in the oil. The presence of high water content could cause dielectric failure.

B) Recommendation

- Highly recommended to perform **OIL PURIFICATION** due to its fluctuation level. Oil purification will remove excessive moisture detected in the transformer oil and thus improving dielectric breakdown voltage of the mineral oil. Furthermore, passivator will be added to preserve both the transformer oil and copper surfaces to enhance the service ability of the transformer

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **ASH HANDLING-2**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
04/07/2017	ONLINE		40				
31/07/2017	ONLINE						
30/08/2017	ONLINE	47		NORMAL	FAIR		NONE
29/09/2017	ONLINE	60		NORMAL	FAIR		NONE
30/10/2017	OFFLINE	32		NORMAL	FAIR		NONE
27/11/2017	OFFLINE	40					
06/12/2017	ONLINE	48					
22/05/2018	ONLINE	45				GOOD	NONE
28/06/2018	OFFLINE						
24/07/2018	ONLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
04/07/2017	ROUTINE	0.022 AC	37.3 AC	36 AC	1.0 AC	0.8788 AC	CLEAR AC	
31/07/2017	ROUTINE	0.022 AC		40 AC	1.0 AC		CLEAR AC	
30/08/2017	ROUTINE	0.022 AC		31 AC	1.5 AC		CLEAR AC	
29/09/2017	ROUTINE	0.022 AC		28 QU	1.5 AC		CLEAR AC	
30/10/2017	ROUTINE	0.020 AC		46 AC	1.5 AC		CLEAR AC	
27/11/2017	ROUTINE	0.022 AC		47 AC	1.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.020 AC	36.6 AC	24 UN	1.5 AC	0.8840 AC	CLEAR AC	
22/05/2018	ROUTINE	0.020 AC		24 UN	1.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.022 AC	35.0 AC	50 AC	1.5 AC	0.8811 AC	CLEAR AC	
24/07/2018	ROUTINE	0.020 AC		27 QU	1.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
04/07/2017	18	21157	64224	4	129	1676	ND	1	ND	152	87209
06/12/2017	20	15791	63530	5	275	2783	ND	4	ND	304	82408
28/06/2018	32	22904	67139	4	249	3112	ND	5	ND	290	93445

RECOMMENDATION:
CARBON DIOXIDE GAS LEVEL IS HIGH.OTHER GASES ARE ASSESSED AS ACCEPTABLE.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
04/07/2017	29	21	2.20	C
31/07/2017	31	32	3.04	D
30/08/2017	34	29	2.38	C
29/09/2017	40	31	1.71	B
30/10/2017	29	21	2.20	C
27/11/2017	29	20	2.10	C
06/12/2017	34	32	2.62	D
22/05/2018	33	32	2.62	D
28/06/2018	28	16	1.89	B
24/07/2018	33	30	2.46	C

NAMEPLATE DATA

MFG	- WOLONG
DATE MFG	- 2011
MAIN TANK S/N	- **10820107**
KVA	- 1600
PRI	- 6300 V
SEC	- 400 V
KILOGRAMS	- 4505
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	- 5.6%
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 1023
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- NO
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- NO
HOSE LENGTH	-
POWER AVAILABLE	- YES

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **ASH HANDLING-2**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
04/07/2017	ND	ND	ND	ND	ND	ND
06/12/2017	ND	ND	3	ND	ND	3
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	-	WOLONG
DATE MFG	-	2011
MAIN TANK S/N	-	**10820107**
KVA	-	1600
PRI	-	6300 V
SEC	-	400 V
KILOGRAMS	-	4505
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	5.6%
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	1023
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
04/07/2017	ND	0.01	ND
06/12/2017	ND	0.01	0.01
28/06/2018	ND	ND	0.02

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	NO
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	NO
HOSE LENGTH	-	
POWER AVAILABLE	-	YES

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
04/07/2017	0.000 AC	1.350 AC
06/12/2017	0.000 AC	0.270 AC
28/06/2018	0.000 AC	0.490 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
04/07/2017	0.22 AC
06/12/2017	0.24 AC
28/06/2018	0.20 AC

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
04/07/2017	NON-COR	3A	MAGENTA
06/12/2017	NON-COR	1A	LIGHT ORANGE
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
14.	TRAFO 1 ESP UNIT 2	10037	17

A) Analysis

- **Acidity** of 0.028mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 69kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range**.**
- **Water Content** in oil of 11ppm is **ACCEPTABLE** while moisture in solid insulation of 1.04% M/dw is graded as **B.** For this transformer, it is recommended to maintain the water content less than 20ppm.

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes.**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 1 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
28/11/2017	OFFLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	OFFLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
28/11/2017	ROUTINE	0.020 AC		48 AC	1.0 AC		CLEAR AC	
06/12/2017	ROUTINE	0.022 AC		22 UN	1.0 AC		CLEAR AC	
21/05/2018	ROUTINE	0.025 AC		24 UN	1.0 AC		CLEAR AC	
28/06/2018	ROUTINE	0.025 AC	32.9 AC	77 AC	1.0 AC	0.8693 AC	CLEAR AC	
24/07/2018	ROUTINE	0.028 AC		69 AC	1.0 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
28/06/2018	93	17225	43231	5	57	775	ND	2	ND	157	61388

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
28/11/2017	27	21	2.48	D
06/12/2017	27	35	4.13	E
21/05/2018	31	32	3.04	E
28/06/2018	28	11	1.30	B
24/07/2018	31	11	1.04	B

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10037**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 1 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10037**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	-
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
28/06/2018	ND	0.06	0.03

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
28/06/2018	0.030 AC	0.420 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
28/06/2018	ND UN

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
28/06/2018	NON-COR	2C	LAVENDER BLUE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
15.	TRAFO 2 ESP UNIT 2	10036	18

A) Analysis

- **Acidity** of 0.059mgKOH/gm is **QUESTIONABLE**. The levels remained stable without further oil degradation. Stabilized condition may proceed with annual monitoring.
- **Dielectric** of 79kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range**.**
- **Water Content** in oil of 8ppm is **ACCEPTABLE** while moisture in solid insulation of 0.76% M/dw is graded as **A**. For this transformer, it is recommended to maintain the water content less than 20ppm.

B) Recommendation

- Do carry-out *Liquid Screen, Liquid Power Factor, Inhibitor, Water Content, Metals-In-Oil, Furan Analysis & DGA periodically for **Condition Monitoring purposes**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 2 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
28/11/2017	OFFLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
28/11/2017	ROUTINE	0.048 AC		55 AC	1.0 AC		CLEAR AC	
06/12/2017	ROUTINE	0.051 QU		59 AC	1.0 AC		CLEAR AC	
21/05/2018	ROUTINE	0.053 QU		55 AC	1.0 AC		CLEAR AC	
28/06/2018	ROUTINE	0.056 QU	31.3 QU	66 AC	1.0 AC	0.8573 AC	CLEAR AC	
24/07/2018	ROUTINE	0.059 QU		79 AC	1.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
28/06/2018	8	22714	64906	5	67	879	ND	ND	ND	80	88579

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
28/11/2017	28	13	1.53	C
06/12/2017	28	14	1.65	C
21/05/2018	31	16	1.52	C
28/06/2018	27	13	1.53	C
24/07/2018	31	8	0.76	A

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10036**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	- 1000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 2 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
28/06/2018	ND	42	ND	ND	ND	42

RECOMMENDATION:
FURAN ANALYSIS SHOWS MINOR DETECTION OF FURANIC COMPOUNDS. THIS IS IN LINE WITH A HEALTHY SOLID INSULATION.

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
28/06/2018	ND	ND	0.02

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10036**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	1000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
28/06/2018	0.000 AC	0.680 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
28/06/2018	ND UN

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
16.	TRAFO 3 ESP UNIT 2	10033	19

A) Analysis

- **Acidity** of 0.070mgKOH/g is **QUESTIONABLE**. This indicates that oxidation by products is in the transformer oil.
- **Dielectric** of 67kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range.
- **Water Content** in oil of 13ppm is **ACCEPTABLE** while moisture in solid insulation of 1.14% M/dw is graded as **B**. For this transformer, it is recommended to maintain the water content less than 20ppm.

B) Recommendation

- Based on previous oil analysis, the IFT of the oil is unfavorable. Together with the high level of Acidity, it is recommended to perform **Transformer Oil Regeneration** on this unit. Transformer oil regeneration at this stage of contamination will effectively remove unwanted oxidation byproducts from the insulating oil. This process will restore the oil back to its original quality, thus protecting the paper insulation and extending the transformer serviceable lifespan. Furthermore, oil inhibitor 2,6-DBPC and passivator will be added to preserve both the transformer oil and copper surfaces to enhance the service ability of the transformer**.**

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 3 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
28/11/2017	OFFLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE			NORMAL		GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
28/11/2017	ROUTINE	0.053 QU		42 AC	1.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.056 QU		60 AC	1.5 AC		CLEAR AC	
21/05/2018	ROUTINE	0.059 QU		51 AC	1.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.062 QU	26.3 UN	78 AC	1.5 AC	0.8602 AC	CLEAR AC	
24/07/2018	ROUTINE	0.070 QU		67 AC	1.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
28/06/2018	14	17627	48672	4	47	935	ND	ND	ND	65	67299

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
28/11/2017	28	15	1.77	D
06/12/2017	28	16	1.89	D
21/05/2018	31	18	1.71	D
28/06/2018	28	14	1.65	C
24/07/2018	32	12	1.14	B

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10033**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	1000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 3 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
28/06/2018	ND	ND	0.02

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10033**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	- 1000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
28/06/2018	0.000 AC	0.570 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
28/06/2018	ND UN

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
28/06/2018	NON-COR	3A	MAGENTA

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
17.	TRAFO 4 ESP UNIT 2	10032	20

A) Analysis

- **Acidity** of 0.031mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 59kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range**.**
- **Water Content** in oil of 13ppm is **ACCEPTABLE** while moisture in solid insulation of 1.24% M/dw is graded as **B**. For this transformer, it is recommended to maintain the water content less than 20ppm.

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes**.

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 4 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
28/11/2017	OFFLINE						
06/12/2017	OFFLINE						
21/05/2018	OFFLINE					GOOD	NONE
28/06/2018	ONLINE						
24/07/2018	OFFLINE						

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
28/11/2017	ROUTINE	0.020 AC		62 AC	1.0 AC		CLEAR AC	
06/12/2017	ROUTINE	0.022 AC		58 AC	1.0 AC		CLEAR AC	
21/05/2018	ROUTINE	0.025 AC		40 AC	1.0 AC		CLEAR AC	
28/06/2018	ROUTINE	0.028 AC	32.6 AC	88 AC	1.0 AC	0.8648 AC	CLEAR AC	
24/07/2018	ROUTINE	0.031 AC		59 AC	1.0 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
28/06/2018	22	25201	74464	5	85	823	ND	ND	ND	112	100600

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
28/11/2017	28	16	1.89	D
06/12/2017	28	17	2.01	D
21/05/2018	31	18	1.71	D
28/06/2018	27	15	1.77	D
24/07/2018	32	13	1.24	B

NAMEPLATE DATA

MFG	-	FUJIAN
DATE MFG	-	2010
MAIN TANK S/N	-	**10032**
KVA	-	
PRI	-	72000 V
SEC	-	380 V
KILOGRAMS	-	1000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	ONAN
IMPEDENCE	-	
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	630
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	NO
H2O COOLED	-	NO
OIL PUMPS	-	NO
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	NO
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	NO

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **TRAFO 4 ESP UNIT 2**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
28/06/2018	ND	ND	ND	ND	ND	ND

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT OBTAINED IN THIS TEST IS IN LINE WITH A HEALTHY PAPER INSULATION OF TRANSFORMER.

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	® IRON	COPPER
28/06/2018	ND	ND	0.03

NAMEPLATE DATA

MFG	- FUJIAN
DATE MFG	- 2010
MAIN TANK S/N	- **10032**
KVA	-
PRI	- 72000 V
SEC	- 380 V
KILOGRAMS	- 1000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- ONAN
IMPEDENCE	-
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 630
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
28/06/2018	0.000 AC	1.620 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
28/06/2018	0.01 UN

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- NO
H2O COOLED	- NO
OIL PUMPS	- NO
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- NO
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- NO

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
28/06/2018	NON-COR	2C	LAVENDER BLUE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

No.	Unit No.	Serial Number	TC
18.	MAIN TRAFO UNIT 2	1006902	21

A) Analysis

- **Acidity** of 0.011mgKOH/g is **ACCEPTABLE**.
- **Dielectric** of 79kV is **ACCEPTABLE**.
- **Colour** and **Visualization** of oil is in the **ACCEPTABLE** range**.**
- **Water Content** in oil of 11ppm is **ACCEPTABLE** while moisture in solid insulation of 0.90% M/dw is graded as **B**. For this transformer, it is recommended to maintain the water content less than 20ppm.

B) Recommendation

- Do carry out *Liquid Screen Tests, Water Content, Furan Analysis, Metals-In-Oil, Liquid Power Factor and Inhibitor Content tests **annually for Condition Monitoring purposes**.

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CENNIX LABORATORY (M) SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **MAIN TRAFO UNIT 2**

LOCATION - OUTDOOR
OTHER -

VISUAL INSPECTION

DATE	STATUS	OIL TEMP °C	W. TEMP °C	OIL LEVEL	PAINT	S. GEL	LEAKS
27/11/2017	ONLINE	50	55				
06/12/2017	ONLINE						
22/05/2018	ONLINE			NORMAL		GOOD	NONE
28/06/2018	OFFLINE	50	45				
24/07/2018	ONLINE					GOOD	

LIQUID SCREEN TEST DATA

DATE	SERVICES	ASTM D974 ACID (mgKOH/gm)	ASTM D971 IFT (mN/m)	IEC 156 DIEL (kV)	ASTM D1500 COLOUR	ASTM D4052 SP. GR.	ASTM D1524 VISUAL	ASTM D1698 ® SEDIMENT
27/11/2017	ROUTINE	0.008 AC		70 AC	0.5 AC		CLEAR AC	
06/12/2017	ROUTINE	0.008 AC		67 AC	0.5 AC		CLEAR AC	
22/05/2018	ROUTINE	0.011 AC		46 AC	0.5 AC		CLEAR AC	
28/06/2018	ROUTINE	0.008 AC	42.1 AC	75 AC	0.5 AC	0.8663 AC	CLEAR AC	
24/07/2018	ROUTINE	0.011 AC		79 AC	0.5 AC		CLEAR AC	

DISSOLVED GAS ANALYSIS (ASTM D3612), EXPRESSED IN PPM

DATE	HYDROGEN	OXYGEN	NITROGEN	METHANE	CARBON MONOXIDE	CARBON DIOXIDE	ETHANE	ETHYLENE	ACETYLENE	TOTAL COMBUSTIBLE	TOTAL GAS
28/06/2018	19	12733	53386	10	193	2448	ND	2	ND	224	68791

RECOMMENDATION:
RETEST 12 MONTHS:
TEST RESULT INDICATES NORMAL OPERATION.

WATER CONTENT (ASTM D1533), EXPRESSED IN PPM

DATE	TEMP°C	PPM	%M/dw	GRADE
27/11/2017	37	16	1.04	B
06/12/2017	38	13	0.85	A
22/05/2018	33	14	1.15	B
28/06/2018	28	10	1.18	B
24/07/2018	33	11	0.90	B

NAMEPLATE DATA

MFG	-	WOLONG
DATE MFG	-	2011
MAIN TANK S/N	-	**1006902**
KVA	-	33000
PRI	-	170000 V
SEC	-	6300 V
KILOGRAMS	-	81000
EQUIP TYPE	-	TRANSFORMER
TRANS CLASS	-	OFAF
IMPEDENCE	-	13.03%
PHASE/CYCLE	-	3/50 Hz
LIQUID TYPE	-	OIL
LITRES LIQUID	-	30857
LTC MFG	-	
LTC S/N	-	
LTC FAB NO	-	
LTC MODEL	-	
LTC LITRES LIQUID	-	
LTC ENERGIZED	-	

ADDITIONAL EQUIPMENT

RADIATORS	-	YES
FANS	-	YES
H2O COOLED	-	NO
OIL PUMPS	-	YES
TOP FPV	-	
BOTTOM FPV	-	
BUCHOLZ	-	YES
CONSERVATOR	-	YES
LTC COMPARTMENT	-	YES
BUSHING LOC	-	TOP
FREE BREATHER	-	YES
HOSE LENGTH	-	
POWER AVAILABLE	-	YES

FIELD SERVICE

DATE	SERVICE

CENNIX LABORATORY SDN BHD

(Formerly known as Myers-Musteq Sdn Bhd)

DATE PRINTED 15/08/2018

ID# - 601669

CUST - PT IP UJP PLTU JERANJANG

SUB NAME -
CITY - MATARAM LOMBOK
UNIT# - **MAIN TRAFO UNIT 2**

LOCATION - OUTDOOR
OTHER -

FURAN ANALYSIS (ASTM D5837), EXPRESSED IN PPB

DATE	5H2F	2FOL	2FAL	2ACF	5M2F	TOTAL
06/12/2017	ND	ND	ND	ND	ND	ND
28/06/2018	ND	ND	ND	ND	113	113

RECOMMENDATION:
RETEST 6 MONTHS: THE PRESENCE OF 5M2F INDICATES THE POSSIBILITY OF HOTSPOT OVERHEATING.

NAMEPLATE DATA

MFG	- WOLONG
DATE MFG	- 2011
MAIN TANK S/N	- **1006902**
KVA	- 33000
PRI	- 170000 V
SEC	- 6300 V
KILOGRAMS	- 81000
EQUIP TYPE	- TRANSFORMER
TRANS CLASS	- OFAF
IMPEDENCE	- 13.03%
PHASE/CYCLE	- 3/50 Hz
LIQUID TYPE	- OIL
LITRES LIQUID	- 30857
LTC MFG	-
LTC S/N	-
LTC FAB NO	-
LTC MODEL	-
LTC LITRES LIQUID	-
LTC ENERGIZED	-

METALS-IN-OIL (ASTM D3635), EXPRESSED IN PPM

DATE	®ALUMINIUM	®IRON	COPPER
28/06/2018	ND	ND	0.03

ADDITIONAL EQUIPMENT

RADIATORS	- YES
FANS	- YES
H2O COOLED	- NO
OIL PUMPS	- YES
TOP FPV	-
BOTTOM FPV	-
BUCHOLZ	- YES
CONSERVATOR	- YES
LTC COMPARTMENT	- YES
BUSHING LOC	- TOP
FREE BREATHER	- YES
HOSE LENGTH	-
POWER AVAILABLE	- YES

LIQUID POWER FACTOR (ASTM D924)

DATE	25°C	100°C
28/06/2018	0.000 AC	0.410 AC

INHIBITOR CONTENT, DBPC (ASTM D2668)

DATE	%BY WEIGHT
28/06/2018	0.22 AC

CORROSIVE SULFUR (ASTM D1275)

DATE	STATUS	CLASS	APPEARANCE
28/06/2018	NON-COR	1B	DARK ORANGE

®PASSIVATOR COUNT, EXPRESSED IN PPM

DATE	PPM

FIELD SERVICE

DATE	SERVICE

3.0 Summary of Our Comments & Recommendations:

No.	Sub Name	Unit No.	TC	Recommendation
1.	MAIN TRAFO UNIT 1	1006901	4	• Periodic condition monitoring
2.	TRAFO 1 ESP UNIT 1	10937	5	• Perform **OIL REGENERATION**
3.	TRAFO 2 ESP UNIT 1	10035	6	• Perform **OIL REGENERATION**
4.	TRAFO 3 ESP UNIT 1	10031	7	• Periodic condition monitoring
5.	TRAFO 4 ESP UNIT 1	10034	8	• Perform **OIL REGENERATION**
6.	MAIN TRAFO UNIT 3	1122170	9	• Periodic condition monitoring
7.	UAT 3	1035082	10	• Periodic condition monitoring
8.	TRAFO 1 ESP UNIT 3	007308428	11	• Periodic condition monitoring
9.	TRAFO 2 ESP UNIT 3	0070084208	12	• Perform **OIL REGENERATION**
10.	TRAFO 3 ESP UNIT 3	0072084208	13	• Perform **OIL PURIFICATION**
11.	TRAFO 4 UNIT 3	0071084208	14	• Periodic condition monitoring
12.	ASH HANDLING-1	10820108	15	• Periodic condition monitoring
13.	ASH HANDLING-2	10820107	16	• Perform **OIL PURIFICATION**
14.	TRAFO 1 ESP UNIT 2	10037	17	• Periodic condition monitoring
15.	TRAFO 2 ESP UNIT 2	10036	18	• Periodic condition monitoring
16.	TRAFO 3 ESP UNIT 2	10033	19	• Perform **OIL REGENERATION**

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No.	Sub Name	Unit No.	TC	Recommendation
17.	TRAFO 4 ESP UNIT 2	10032	20	• Periodic condition monitoring
18.	MAIN TRAFO UNIT 2	1006902	21	• Periodic condition monitoring

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TXM

no	Test Cer.	Date Test	nama unit		Serial number	thn opr	Jumlah minyak, liter	Buatan	acid	ift	diel.	color	spec. Graf.	visual	sedi.	moisture ppm	moisture grade	hasil test dga ASTM H_2	O_2	N_2	CH_4	CO
Standard yang dipakai									ASTM D974	ASTM D971	IEC 156	ASTM D1500	ASTM D4052	ASTM D1524	ASTM D1698	ASTM D1533		hydrogen	oksigen	nitrogen	methane	carbon monoksida
								BATASAN OPERASI	< 0,06	> 32	> 30	< 3,5	> 0,84	C		< 20		< 100			< 120	< 350
1	1	27/02/17	Main trafo	1	1006901	2011	30.857	Wolong	0,014	39,9	99	0,5	0,8693	C		9	A	**135**	15.834	57.625	27	**807**
	4	04/07/17							0,017	41,5	58	0,5	0,8691	C		10	A	**147**	9.471	4.328	32	**655**
	4	30/07/2017							0,017		70	0,5		C		8	B					
	4	30/08/2017							0,017		92	0,5		C		6	A					
	4	29/09/2017							0,014		82	0,5		C		8	A					
	4	30/10/2017							0,014		82	0,5		C		6	A					
	4	27/11/2017							0,014		53	0,5		C		8	A					
	4	07/12/2017							0,011	40,1	87	0,5	0,8745	C		7	A	**183**	12.895	43.794	39	**715**
	4	21/05/2018							0,011		77	0,5		C		10	B					
	4	28/06/2018							0,014	41,9	69	0,5	0,8716	C		7	A	**176**	11.044	46.776	41	**758**
	4	24/07/2018							0,014		86	0,5		C		6	A					
2	5	04/07/17	Trafo 1 ESP	1	10937	2010	1.143	Fujia	0,056	**25,3**	50	1,5	0,8529	C		18	**D**	35	20.494	67.487	4	69
	5	30/07/2017							0,059		57	1,5		C		20	**D**					
	5	30/08/2017							0,056		65	1,5		C		18	**D**					
	5	29/09/2017							0,059		58	1,5		C		19	**D**					
	5	30/10/2017							0,059		**23**	1,5		C		32	**C**					
	5	27/11/2017							0,062		**25**	1,5		C		**33**	**C**					
	5	07/12/2017							0,062	**25,0**	49	1,5	0,8593	C		18	**D**	39	19.933	67.198	4	83
	5	21/05/2018							**0,065**		38	1,5		C		33	**E**					
	5	28/06/2018							**0,067**	**25,9**	32	1,5	0,8560	C		30	**E**	44	20.039	64.529	4	119
	5	24/07/2018							**0,073**		38	1,5		C		**19**	**D**					
3	6	04/07/17	Trafo 2 ESP	1	10035	2010	1.143	Fujia	0,042	**26,6**	41	1,5	0,8540	C		**21**	**D**	27	18.639	66.781	3	64
	6	30/07/2017							0,045		**25**	1,5		C		**27**	**E**					
	6	30/08/2017							0,042		42	1,5		C		14	C					
	6	29/09/2017							0,048		59	1,5		C		19	**D**					
	6	30/10/2017							0,051		62	1,5		C		17	B					
	6	27/11/2017							0,051		50	1,5		C		18	B					
	6	07/12/2017							**0,063**	27,3	51	1,5	0,8589	C		17	**D**	20	19.360	61.590	3	45
	6	21/05/2018							0,056		45	1,5		C		20	**D**					
	6	28/06/2018							0,059	**27,6**	55	1,5	0,8570	C		17	**C**	22	22.494	64.443	4	57
	6	24/07/2018							**0,062**		47	1,5		C		15	**C**					
4	7	04/07/17	Trafo 3 ESP	1	10031	2010	1.143	Fujia	0,048	**28,4**	44	1,0	0,8537	C		**32**	**E**	32	15.273	65.111	5	95
	7	30/07/2017							0,042		77	1,5				10	**D**					
	7	30/08/2017							0,042		61	1,5		C		13	C					
	7	29/09/2017							0,045		72	1,5		C		14	B					
	7	30/10/2017							0,048		72	1,5		C		16	B					
	7	27/11/2017							0,051		62	1,5		C		17	**C**					
	7	07/12/2017							**0,063**	29,3	57	1,5	0,8624	C		16	**C**	7	14.730	65.738	3	42
	7	21/05/2018							0,056		48	1,5		C		21	**D**					
	7	28/06/2018							0,053	**29,7**	62	1,5	0,8605	C		17	**D**	9	17.958	66.007	4	46
	7	24/07/2018							0,510		64	1,5		C		17	**D**					
5	8	04/07/17	Trafo 4 ESP	1	10034	2010	1.143	Fujia	0,028	**26,3**	**24**	1,5	0,8596	C		**29**	**E**	13	12.265	66.770	5	172

TXM

no	Test Cer.	Date Test	nama unit		laboratorium cennix D3612					lpf (C)		dbpc	furan	metal in oil			corr. sul	keterangan
					CO_2	C_2H_6	C_2H_4	C_2H_2	TOT	25°	100°			Al	Fe	Cu		
				Standa	carbon dioksida	ethane	ethylene	acethylene		ASTM D924		ASTM D2668	ASTM D5837	ASTM D3635			ASTM D1275B	
					< 2.500	< 65	<50	< 2	< 687	< 0.1	< 2.9	> .2	< 100	0,00	0,00	0,00		Non corrosive
1	1	27/02/17	Main trafo	1	**3.099**	3	4	0	**976**	0,000	0,070	0,32	0	0,00	0,00	0,01	1B	Non Corrosive
	4	04/07/17			**2.728**	4	5	0	**843**	0,000	0,140	0,24	0	0,02	0,01	0,01	3 A	Suspec Corrosive
	4	30/07/2017																
	4	30/08/2017																
	4	29/09/2017																
	4	30/10/2017																
	4	27/11/2017																
	4	07/12/2017			**3.166**	5	5	0	**947**	0,000	0,040	0,27	0	0,00	0,01	0,04	2C	Non corrosive
	4	21/05/2018																
	4	28/06/2018			**3.393**	5	6	0	**986**	0,000	0,140	0,24	0	0,00	0,00	0,04	**3 A**	**Suspec Corrosive**
	4	24/07/2018																
2	5	04/07/17	Trafo 1 ESP	1	1.143	0	1	0	109	0,000	1,870	**0,00**	95	0,00	0,01	0,01	1 B	Non Corrosive
	5	30/07/2017																
	5	30/08/2017																
	5	29/09/2017																
	5	30/10/2017																
	5	27/11/2017																
	5	07/12/2017			1.261	0	1	0	127	0,000	0,570	**0,00**	75	0,00	0,00	0,00	1A	Non corrosive
	5	21/05/2018																
	5	28/06/2018			1.696	0	2	0	169	0,000	0,680	**0,00**	85	0,00	0,00	0,03	1 B	Non corrosive
	5	24/07/2018																
3	6	04/07/17	Trafo 2 ESP	1	1.106	0	1	0	95	0,000	1,900	**0,02**	62	0,00	0,01	0,00	1 A	Non Corrosive
	6	30/07/2017																
	6	30/08/2017																
	6	29/09/2017																
	6	30/10/2017																
	6	27/11/2017																
	6	07/12/2017			729	0	1	0	69	0,000	0,980	**0,02**	67	0,00	0,00	0,02	1B	Non corrosive
	6	21/05/2018																
	6	28/06/2018			789	0	0	0	83	0,000	1,130	**0,00**	84	0,00	0,00	0,02	1 B	Non corrosive
	6	24/07/2018																
4	7	04/07/17	Trafo 3 ESP	1	1.002	0	2	0	134	0,000	1,700	**0,01**	32	0,01	0,01	0,01	1 A	Non corrosive
	7	30/07/2017																
	7	30/08/2017																
	7	29/09/2017																
	7	30/10/2017																
	7	27/11/2017																
	7	07/12/2017			617	0	0	0	52	0,000	0,630	**0,01**	14	0,00	0,00	0,00	**2C**	Non corrosive
	7	21/05/2018																
	7	28/06/2018			781	0	1	0	60	0,000	1,030	**0,00**	20	0,00	0,00	0,11	**1 B**	Non corrosive
	7	24/07/2018																
5	8	04/07/17	Trafo 4 ESP	1	1.206	0	8	0	198	**0,180**	**6,680**	**0,08**	18	0,05	0,02	0,01	**2 C**	Non Corrosive

TXM

no	Test Cer.	Date Test	nama unit	Standa	MALAYSIAN LAB RECOMMENDATION
1	1	27/02/17	Main trafo	1	Retest 6 months: DGA Check leakages Other parameters: Periodic Condition Monitoring
	4	04/07/17			Retest 6 months: DGA Add inhibitor 2,6-DBPC and Passivator Other parameters: Periodic Condition Monitoring
	4	30/07/2017			Periodic condition monitoring
	4	30/08/2017			Periodic condition monitoring
	4	29/09/2017			Periodic condition monitoring
	4	30/10/2017			Periodic condition monitoring
	4	27/11/2017			Periodic condition monitoring
	4	07/12/2017			Retest 6 mnth : DGA
	4	21/05/2018			Periodic condition monitoring
	4	28/06/2018			Add passivator
	4	24/07/2018			Periodic condition monitoring
2	5	04/07/17	Trafo 1 ESP	1	**Perform OIL REGENERATION**
	5	30/07/2017			**Perform OIL REGENERATION**
	5	30/08/2017			**Perform OIL REGENERATION**
	5	29/09/2017			**Perform OIL REGENERATION**
	5	30/10/2017			**Perform OIL REGENERATION**
	5	27/11/2017			**Perform OIL REGENERATION**
	5	07/12/2017			**Perform OIL REGENERATION**
	5	21/05/2018			**Perform OIL REGENERATION**
	5	28/06/2018			**Perform OIL REGENERATION**
	5	24/07/2018			**Perform OIL REGENERATION**
3	6	04/07/17	Trafo 2 ESP	1	**Perform OIL REGENERATION**
	6	30/07/2017			**Perform OIL REGENERATION**
	6	30/08/2017			**Perform OIL REGENERATION**
	6	29/09/2017			**Perform OIL REGENERATION**
	6	30/10/2017			**Perform OIL REGENERATION**
	6	27/11/2017			**Perform OIL REGENERATION**
	6	07/12/2017			**Perform OIL REGENERATION**
	6	21/05/2018			**Perform OIL REGENERATION**
	6	28/06/2018			Perform **OIL REGENERATION**
	6	24/07/2018			**Perform OIL REGENERATION**
4	7	04/07/17	Trafo 3 ESP	1	Retest 6 months: Acidity, IFT, LPF, Diel and Water Content Add inhibitor 2,6-DBPC and Passivator Other parameters: Periodic Condition Monitoring
	7	30/07/2017			Retest 6 months: **Acidity, IFT** and **Liquid Power Factor** Other parameters: Periodic Condition Monitoring
	7	30/08/2017			Periodic condition monitoring
	7	29/09/2017			Periodic condition monitoring
	7	30/10/2017			Periodic condition monitoring
	7	27/11/2017			Periodic condition monitoring
	7	07/12/2017			Retest 6 months: Acidity, IFT
	7	21/05/2018			Retest 6 months: **Acidity, IFT, Dielectric and Water Content**
	7	28/06/2018			Add inhibitor 2,6-DBPC and PASSIVATOR
	7	24/07/2018			Periodic condition monitoring
5	8	04/07/17	Trafo 4 ESP	1	**Perform OIL REGENERATION** Inspect silica gel

PAK SOETJAHJONO (TXM ADVISOR) RECOMMENDATION

For TEST 24 Juli 2018

GANTI MINYAK

Disarankan dilakukan untuk beberapa trafo **ESP (Unit 1 no 1 dan 2 , Unit 2 no 3)** karena nilai Acid sudah melewati standard. Sedang untuk **ESP Unit 2 no 2** ada trend Acid yang memburuk, dipersiapkan untuk penggantian oli juga.

PURIFIKASI

Disarankan dilakukan pada trafo **Ash Handling no 2 , Trafo ESP Unit 1 no 3 dan 4**, karena Water Content Grade di bawah standard. Purifikasi agar dilakukan dengan temperatur tinggi dan lebih dari 5 cycle, agar berpengaruh ke Water Content Grade

FOR TEST 28 Juni 2018

Masih ada beberapa trafo **ESP** (**no 1 Unit 1** dan **no 2 Unit 2)** yang Acid dan IFT di bawah standard. Kami sarankan untuk **ganti minyak.**

Trafo-trafo **ESP** (**no 2,3,4 unit 1 , no 2,3,4 Unit 2 , n 2,3 Unit 3**) dan **Ash Handling 1** yang Grade Misture di bawah B, kami sarankan untuk dilakukan **Purifikasi**

Pada **ESP 2,3,4 Unit 3** ditemukan Spesific Grafity di bawah stadanrd. Kemungkinan penggantian oli menggunakan **bukan Mineral Oli.** Mohon dicek kembali type oli pengganti atau dilakukan trending dalam 12 bulan mendatang.

FURAN

Semua Trafo ESP Unit 1, ESP 2 Unit 2 dan **ESP 3 Unit 3** telah ditemukan jejak Furan akibat moisture tinggi yang cukup lama. Kami sarankan **untuk menjaga kondisi moisture** pada waktu selanjutnya agar perkembangan Furan tidak berlanjut
Main Trafo Unit 2 ditemukan jejak Furan 5M2F (ada hot spot) tetapi tidak ditemukan Combustible Gas berlebih pada test DGA. Hal ini mengakibatkan pengamanan terhadapat gangguan petir kurang memadai. Kami sarankan untuk di**perbaiki baiksystim groundingnya maupun arresternya**

CORROSIVE SULPHUR

Main Trafo Unit 1 dan 3 serta **trafo UAT** dideteksi mulai ada corrosive sulphur. Untuk mencegah percepatan pertumbuhannya dan memperpanjang umur trafo, kami sarankan **menambah Passivator**

FOR TEST 21 Mei 2018

Mengingat banyak trafo **ESP (Tc 5,6,7,8,11,12,13)** yang kurang

TXM

no	Test Cer.	Date Test	nama unit		Serial number	thn opr	Jumlah minyak, liter	Buatan	acid	ift	diel.	color	spec. Graf.	visual	sedi.	moisture ppm	moisture grade	H_2	O_2	N_2	CH_4	CO
																		hasil test				dga ASTM
Standard yang dipakai									ASTM D974	ASTM D971	IEC 156	ASTM D1500	ASTM D4052	ASTM D1524	ASTM D1698	ASTM D1533		hydrogen	oksigen	nitrogen	methane	carbon monoksida
								BATASAN OPERASI	< 0,06	> 32	> 30	< 3,5	> 0,84	C		< 20		< 100			< 120	< 350
	8	30/07/2017							0,022		88	1,5		C		15	**D**					
	8	30/08/2017							0,028		44	1,5		C		13	C					
	8	29/09/2017							0,031		53	1,0		C		15	B					
	8	30/10/2017							0,028		48	1,0		C		18	B					
	8	27/11/2017							0,034		41	1,5		C		***30***	***D***					
	8	07/12/2017							0,031	27,2	41	1,5	0,8645	C		18	***D***	9	13.331	63.527	3	70
	8	21/05/2018							0,034		37	1,5		C		**23**	**D**					
	8	28/06/2018							0,037	**27,5**	55	1,5	0,8653	C		20	**D**	9	17.962	64.248	4	75
	8	24/07/2018							0,039		50	1,5		C		19	**D**					
6	2	27/02/17	Main trafo	3	1122170	2010	26.706	Shandong	0,017	39,7	87	0,5	0,8781	C		9	A	4	13.330	43.140	9	**808**
	9	04/07/17							0,017	42,3	78	0,5	0,8780	C		15	B	24	10.131	44.084	11	**641**
	9	30/07/2017							0,014		77	0,5		C		17	B					
	9	30/08/2017							0,017		86	0,5		C		8	A					
	9	29/09/2017							0,014		86	0,5		C		10	A					
	9	30/10/2017							0,014		88	0,5		C		9	A					
	9	27/11/2017							0,014		87	0,5		C		8	A					
	9	07/12/2017							0,014	41,5	84	0,5	0,8932	C			A	39	14.023	43.226	11	**668**
	9	21/05/2018							0,014		58	0,5		C		11	B					
	9	28/06/2018							0,014	41,0	85	0,5	0,8805	C		8	A	18	11.431	48.283	13	**700**
	9	24/07/2018							0,014		77	0,5		C		8	A					
7	3	27/02/17	Trafo UAT	3	1035082	2010	4.749	Shandong	0,017	37,6	94	0,5	0,8768	C		9	A	20	12.535	56.879	20	**985**
	10	04/07/17							0,022	38,1	60	0,5	0,8767	C		11	A	20	16.028	68.308	20	**971**
	10	30/07/2017							0,025		88	0,5		C		14	B					
	10	30/08/2017							0,022		89	0,5		C		11	A					
	10	29/09/2017							0,020		80	0,5		C		12	A					
	10	30/10/2017							0,022		86	0,5		C		11	A					
	10	27/11/2017							0,022		86	0,5		C		12	A					
	10	07/12/2017							0,020	37,6	86	0,5	0,8200	C		12	A	36	18.752	66.758	1	**1.116**
	10	21/05/2018							0,020		81	0,5		C		14	B					
	10	28/06/2018							0,022	37,5	79	0,5	0,8793	C		10	A	35	13.798	68.180	22	**1.144**
	10	24/07/2018							0,020		76	0,5		C		11	A					
8	11	04/07/17	Trafo 1 ESP	3	007308428	2010	731	Zhejian	0,022	**23,2**	32	1,5	0,8432	C		**26**	**D**	14	12.943	68.807	3	62
	11	30/07/2017							0,028		47	1,5		C		**21**	**D**					
	11	30/08/2017							0,028		36	1,5		C		**22**	**D**					
	11	29/09/2017							0,025		45	1,5		C		20	C					
	11	30/10/2017							0,025		40	1,5		C		19	**D**					
	11	27/11/2017							0,025		31	1,5		C		**34**	**C**					
	11	07/12/2017							0,022	34,6	31	1,5	***0,8190***	C		**31**	**C**	14	12.739	65.097	3	66
	11	21/05/2018							0,022		31	0,5		C		**27**	**D**					
	11	28/06/2018							0,022	35,0	60	0,5	***0,8154***	C		**10**	**B**	19	15.552	64.448	3	57
	11	24/07/2018							0,020		53	0,5		C		**9**	**B**					
9	12	04/07/17	Trafo 2 ESP	3	007008428	2010	731	Zhejian	**0,118**	**16,2**	**24**	3,0	0,8435	C		**39**	**D**	38	16.781	70.523	5	129
	12	30/07/2017							**0,112**		**28**	3,0		C		**38**	**E**					

TXM

no	Test Cer.	Date Test	nama unit		laboratorium cennix D3612					lpf (C)		dbpc	furan	metal in oil			corr. sul	keterangan
					CO_2	C_2H_6	C_2H_4	C_2H_2	TOT	25°	100°			Al	Fe	Cu		
				Standa	carbon dioksida	ethane	ethylene	acethylene		ASTM D924		ASTM D2668	ASTM D5837	ASTM D3635			ASTM D1275B	
					< 2.500	< 65	<50	< 2	< 687	< 0.1	< 2.9	> .2	< 100	0,00	0,00	0,00		Non corrosive
	8	30/07/2017																
	8	30/08/2017																
	8	29/09/2017																
	8	30/10/2017																
	8	27/11/2017																
	8	07/12/2017			720	0	1	0	83	0,010	2,180	**0,06**	0	0,00	0,00	0,02	2C	Non corrosive
	8	21/05/2018																
	8	28/06/2018			1.054	0	2	0	90	0,060	2,850	**0,02**	21	0,00	0,00	0,05	**3 A**	**Suspec Corrosive**
	8	24/07/2018																
6	2	27/02/17	Main trafo	3	**2.878**	0	1	0	**822**	0,000	0,090	0,30	0	0,00	0,03	0,02	1A	Non corrosive
	9	04/07/17			2.250	1	1	0	678	0,000	0,130	0,22	0	0,01	0,01	0,02	**3 A**	**Suspec Corrosive**
	9	30/07/2017																
	9	30/08/2017																
	9	29/09/2017																
	9	30/10/2017																
	9	27/11/2017																
	9	07/12/2017			2.456	0	1	0	719	0,000	0,070	0,22	0	0,01	0,00	0,03	2C	Non corrosive
	9	21/05/2018																
	9	28/06/2018			1.512	1	1	0	733	0,000	0,110	**0,19**	0	0,00	0,01	0,06	**3 A**	**Suspec Corrosive**
	9	24/07/2018																
7	3	27/02/17	Trafo UAT	3	**3.877**	6	7	0	**1.038**	0,000	0,100	0,30	0	0,00	0,01	0,04	1A	Non Corrosive
	10	04/07/17			**3.536**	5	7	0	**1.023**	0,000	0,390	0,23	0	0,02	0,01	0,04	**3 A**	**Suspec Corrosive**
	10	30/07/2017																
	10	30/08/2017																
	10	29/09/2017																
	10	30/10/2017																
	10	27/11/2017																
	10	07/12/2017			**3.622**	5	7	0	**1.165**	0,000	0,170	0,23	0	0,00	0,01	0,08	2C	Non corrosive
	10	21/05/2018																
	10	28/06/2018			**3.644**	5	7	1	**1.214**	0,000	0,140	0,21	0	0,00	0,01	0,11	**3 A**	**Suspec Corrosive**
	10	24/07/2018																
8	11	04/07/17	Trafo 1 ESP	3	1.243	0	0	0	79	0,000	0,350	**0,00**	0	0,01	0,01	0,00	1 B	Non corrosive
	11	30/07/2017																
	11	30/08/2017																
	11	29/09/2017																
	11	30/10/2017																
	11	27/11/2017																
	11	07/12/2017			612	0	0	0	83	0,000	0,040	0,18	0	.01	0,00	0,00	2E	Non corrosive
	11	21/05/2018																
	11	28/06/2018			1.391	0	0	0	79	0,000	0,050	0,16	0	0,00	0,00	0,02	1 B	Non corrosive
	11	24/07/2018																
9	12	04/07/17	Trafo 2 ESP	3	2.431	3	5	0	180	0,000	1,330	**0,00**	**169**	0,00	0,01	0,01	**2 C**	**Non corrosive**
	12	30/07/2017																

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no	Test Cer.	Date Test	nama unit	Standa	MALAYSIAN LAB RECOMMENDATION	PAK SOETJAHJONO (TXM ADVISOR) RECOMMENDATION
	8	30/07/2017			**Perform OIL REGENERATION**	memenuhi syarat. Kami sarankan untuk diganti minyak saja. Selain jumlah minyaknya sedikit biaya juga akan jauh lebih murah, Saran kami saat penggantian minyak melalui purifikasi dengan temperatur lebih dari 650C dan vacuum diatas 74 CMHg diatas 7 cycle Trafo **ESP (Tc 6,7,8)** Furan (FOL) banyak berkurang karena moisture cukup banyak dalam kertas dan kemungkinan juga kualitas kertas kurang bagus Untuk trafo **Ash Handling** sebaiknya segera dipurifikasi juga dengan temperatur diats 650c dan vacuum diatas 74 CMHg sekitar >7 cycle Trafo **ESP 1 unit 2,** nilai Dielectric nya cukup rendah ditambah dengan kondisi Moisture yang buruk, sebaiknya segera dilakukan Purifikasi. Kondisi semua trafo **ESP Unit 2 (Tc 17, 18, 19, 20)** Grade Moisture rendah, yang artinya kandungan air dalam isolasi kertas cukup tinggi. Kami sarankan untuk dimonitor dengan test DGA agar bisa diantisipasi jika ada kondisi gangguan thermal yang terjadi pada trafo trafo tersebut.
	8	30/08/2017			**Perform OIL REGENERATION**	
	8	29/09/2017			**Perform OIL REGENERATION**	
	8	30/10/2017			**Perform OIL REGENERATION**	
	8	27/11/2017			**Perform OIL REGENERATION**	
	8	07/12/2017			**Perform OIL REGENERATION**	
	8	21/05/2018			**Perform OIL REGENERATION**	
	8	28/06/2018			Perform **OIL REGENERATION**	
	8	24/07/2018			**Perform OIL REGENERATION**	
6	2	27/02/17	Main trafo	3	Retest 6 months: DGA	
					Other parameters: Periodic Condition Monitoring	
	9	04/07/17			Add Passivator	
					Periodic Condition Monitoring	
	9	30/07/2017			Periodic condition monitoring	
	9	30/08/2017			Periodic condition monitoring	
	9	29/09/2017			Periodic condition monitoring	
	9	30/10/2017			Periodic condition monitoring	
	9	27/11/2017			Periodic condition monitoring	
	9	07/12/2017			Periodic condition monitoring	
	9	21/05/2018			Periodic condition monitoring	
	9	28/06/2018			Add passivator	
	9	24/07/2018			Periodic condition monitoring	
7	3	27/02/17	Trafo UAT	3	Retest 6 months: DGA Other parameters: Periodic Condition Monitoring	
	10	04/07/17			Add Passivator Periodic Condition Monitoring Inspect silica gel	
	10	30/07/2017			Periodic condition monitoring	
	10	30/08/2017			Periodic condition monitoring	
	10	29/09/2017			Periodic condition monitoring	
	10	30/10/2017			Periodic condition monitoring	
	10	27/11/2017			Periodic condition monitoring	
	10	07/12/2017			Periodic condition monitoring	
	10	21/05/2018			Periodic condition monitoring	
	10	28/06/2018			Retest 6 months: DGA Add Passivator	
	10	24/07/2018			Periodic condition monitoring	
8	11	04/07/17	Trafo 1 ESP	3	**Perform OIL REGENERATION**	
	11	30/07/2017			**Perform OIL REGENERATION**	
	11	30/08/2017			**Perform OIL REGENERATION**	
	11	29/09/2017			**Perform OIL REGENERATION**	
	11	30/10/2017			**Perform OIL REGENERATION**	
	11	27/11/2017			**Perform OIL REGENERATION**	
	11	07/12/2017			**Perform OIL PURIFICATION**	
	11	21/05/2018			**Perform OIL PURIFICATION**	
	11	28/06/2018			Retest 12 months: Specific Gravity Add Passivator	
	11	24/07/2018			Periodic condition monitoring	
9	12	04/07/17	Trafo 2 ESP	3	**Perform OIL REGENERATION**	
	12	30/07/2017			**Perform OIL REGENERATION**	

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no	Test Cer.	Date Test	nama unit		Serial number	thn opr	Jumlah minyak, liter	Buatan	acid	ift	diel.	color	spec. Graf.	visual	sedi.	moisture ppm	moisture grade	H_2	O_2	N_2	CH_4	CO
																		hasil test				**dga ASTM**
Standard yang dipakai									ASTM D974	ASTM D971	IEC 156	ASTM D1500	ASTM D4052	ASTM D1524	ASTM D1698	ASTM D1533		hydrogen	oksigen	nitrogen	methane	carbon monoksida
								BATASAN OPERASI	< 0,06	> 32	> 30	< 3,5	> 0,84	C		< 20		< 100			< 120	< 350
	12	30/08/2017							**0,109**		34	2,5		C		17	**D**					
	12	29/09/2017							**0,115**		**21**	2,5		C		**37**	**D**					
	12	30/10/2017							**0,118**		33	2,5		C		**20**	**D**					
	12	27/11/2017							0,017		**25**	0,5		C		**28**	B					
	12	07/12/2017							0,022	**29,7**	**29**	0,1	***0,8106***	C		**44**	**D**	42	19.523	66.059	3	102
	12	21/05/2018							0,022		**28**	0,5		C		**30**	**E**					
	12	28/06/2018							0,025	**30,2**	34	0,5	***0,8080***	C		16	**C**	43	22.272	68.719	4	38
	12	24/07/2018							0,022		30	0,5		C		**25**	**D**					
10	13	04/07/17	Trafo 3 ESP	3	007208428	2010	731	Zhejian	0,025	**27,8**	40	1,5	0,8415	C		**27**	**D**	21	16.364	70.694	3	38
	13	30/07/2017							0,025		66	1,5		C		18	**D**					
	13	30/08/2017							0,025		50	1,5		C		21	C					
	13	29/09/2017							0,028		59	1,5		C		22	C					
	13	30/10/2017							0,028		55	1,5		C		**28**	**D**					
	13	27/11/2017							0,014		39	0,5		C		**24**	B					
	13	07/12/2017							0,014	39,8	45	0,5	0,8099	C		**29**	B	15	14.515	65.277	2	40
	13	21/05/2018							0,014		54	0,5		C		**23**	**D**					
	13	28/06/2018							0,017	38,4	43	0,5	0,8075	C		**22**	**C**	30	15.202	64.188	4	65
	13	24/07/2018							0,014		43	0,5		C		**20**	**C**					
11	14	04/07/17	Trafo 4 ESP	3	007108428	2010	731	Zhejian	0,020	31,2	62	1,0	0,8420	C		19	**D**	10	18.669	66.036	3	24
	14	30/07/2017							0,022		60	1,0		C		15	C					
	14	30/08/2017							0,020		55	1,0		C		17	**D**					
	14	29/09/2017							0,022		59	1,0		C		15	C					
	14	30/10/2017							0,025		55	1,0		C		15	**D**					
	14	27/11/2017							0,022		69	1,0		C		16	**C**					
	14	07/12/2017							0,025	29,8	43	1,0	0,8471	C		19	**D**	14	15.414	63.712	2	22
	14	21/05/2018							0,028		37	1,0		C		**21**	**D**					
	14	28/06/2018							0,025	**30,5**	71	1,0	0,8442	C		11	A	20	14.690	67.822	2	22
	14	24/07/2018							0,022		42	1,0		C		11	**C**					
12	15	04/07/17	Ash Handling		10820108	2011	1.023	Wolong	0,022	38,1	38	1,0	0,8779	C		**28**	**C**	35	10.984	71.058	20	**441**
	15	30/07/2017							0,025		56	1,0		C		**21**	**D**					
	15	30/08/2017							0,022		53	1,0		C		16	B					
	15	29/09/2017							0,022		57	1,0		C		16	B					
	15	30/10/2017							0,022		45	1,0		C		20	B					
	15	27/11/2017							0,020		36	1,0		C		**29**	**C**					
	15	07/12/2017							0,017	37,5	34	1,0	0,8932	C		**26**	B	49	12.034	67.124	20	**558**
	15	21/05/2018							0,022		33	1,0		C		**26**	**C**					
	15	28/06/2018							0,025	37,5	42	1,0	0,8804	C		**24**	**C**	53	10.939	69.394	20	**557**
	15	24/07/2018							0,022		39	1,0		C		20	B					
13	16	04/07/17	Ash Handling		10820107	2011	1.023	Wolong	0,022	37,3	36	1,0	0,8788	C		21	**C**	18	21.157	64.224	4	129
	16	30/07/2017							0,022		40	1,0		C		**32**	**D**					
	16	30/08/2017							0,022		31	1,0		C		**29**	C					

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no	Test Cer.	Date Test	nama unit		laboratorium cennix D3612					lpf (C)		dbpc	furan	metal in oil			corr. sul	keterangan
					CO_2	C_2H_6	C_2H_4	C_2H_2	TOT	25°	100°			Al	Fe	Cu		
				Standa	carbon dioksida	ethane	ethylene	acethylene		ASTM D924		ASTM D2668	ASTM D5837	ASTM D3635			ASTM D1275B	
					< 2.500	< 65	<50	< 2	< 687	< 0.1	< 2.9	> .2	< 100	0,00	0,00	0,00		Non corrosive
	12	30/08/2017																
	12	29/09/2017																
	12	30/10/2017																
	12	27/11/2017																
	12	07/12/2017			912	0	0	0	147	0,000	0,030	0,20	0	0,00	0,00	0,00	3A	Non corrosive
	12	21/05/2018																
	12	28/06/2018			1.226	0	0	0	85	0,000	0,040	**0,19**	0	0,00	0,00	0,02	**3 A**	**Suspec Corrosive**
	12	24/07/2018																
10	13	04/07/17	Trafo 3 ESP	3	1.068	0	0	0	62	0,000	0,620	**0,01**	0	0,00	0,01	0,00	**2 C**	**Non corrosive**
	13	30/07/2017																
	13	30/08/2017																
	13	29/09/2017																
	13	30/10/2017																
	13	27/11/2017																
	13	07/12/2017			559	0	0	0	57	0,000	.08	.21	0	0,00	0,00	0,00	2E	Non corrosive
	13	21/05/2018																
	13	28/06/2018			1.833	0	0	0	99	0,000	0,010	0,20	4	0,00	0,00	0,02	2 E	Non corrosive
	13	24/07/2018																
11	14	04/07/17	Trafo 4 ESP	3	665	0	0	0	37	0,000	1,360	**0,01**	0	0,00	0,00	0,00	**3 A**	**Suspec Corrosive**
	14	30/07/2017																
	14	30/08/2017																
	14	29/09/2017																
	14	30/10/2017																
	14	27/11/2017																
	14	07/12/2017			675	0	0	0	38	0,000	0,370	**0,03**	0	0,00	0,00	0,00	1B	Non corrosive
	14	21/05/2018																
	14	28/06/2018			683	0	0	0	44	0,000	0,550	**0,00**	0	0,00	0,03	0,02	1 B	Non corrosive
	14	24/07/2018																
12	15	04/07/17	Ash Handling		5.037	7	8	0	511	0,000	0,730	0,23	0	0,00	0,01	0,01	1 B	Non corrosive
	15	30/07/2017																
	15	30/08/2017																
	15	29/09/2017																
	15	30/10/2017																
	15	27/11/2017																
	15	07/12/2017			**5.440**	8	9	0	644	0,000	0,240	0,24	0	0,00	0,00	0,01	2C	Non corrosive
	15	21/05/2018																
	15	28/06/2018			**5.425**	9	8	0	647	0,000	0,460	0,22	0	0,00	0,01	0,04	1 B	Non corrosive
	15	24/07/2018																
13	16	04/07/17	Ash Handling		1.676	0	1	0	152	0,000	1,350	0,22	0	0,00	0,01	0,00	**3 A**	**Suspec Corrosive**
	16	30/07/2017																
	16	30/08/2017																

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no	Test Cer.	Date Test	nama unit		MALAYSIAN LAB RECOMMENDATION	PAK SOETJAHJONO (TXM ADVISOR) RECOMMENDATION
				Standa		
	12	30/08/2017			**Perform OIL REGENERATION**	
	12	29/09/2017			**Perform OIL REGENERATION**	
	12	30/10/2017			**Perform OIL REGENERATION**	
	12	27/11/2017			**Perform OIL REGENERATION**	
	12	07/12/2017			**Perform OIL REGENERATION**	
	12	21/05/2018			**Perform OIL PURIFICATION**	
	12	28/06/2018			Retest 12 months: Specific Gravity Add Passivator	
	12	24/07/2018			**Perform OIL REGENERATION**	
10	13	04/07/17	Trafo 3 ESP	3	**Perform OIL REGENERATION**	
	13	30/07/2017			**Perform OIL REGENERATION**	
	13	30/08/2017			**Perform OIL REGENERATION**	
	13	29/09/2017			**Perform OIL REGENERATION**	
	13	30/10/2017			**Perform OIL REGENERATION**	
	13	27/11/2017			**Perform OIL REGENERATION**	
	13	07/12/2017			**Perform OIL PURIFICATION**	
	13	21/05/2018			**Perform OIL PURIFICATION**	
	13	28/06/2018			Retest 12 months: Specific Gravity Retest 6 months: Dielectric and Water Content Add Passivator	
	13	24/07/2018			**Perform OIL PURIFICATION**	
11	14	04/07/17	Trafo 4 ESP	3	Retest 6 months: Acidity, IFT and LPF Add inhibitor 2,6-DBPC and Passivator Other parameters: Periodic Condition Monitoring	
	14	30/07/2017			Retest 6 months: **Acidity, IFT** and **Liquid Power Factor** Other parameters: Periodic Condition Monitoring	
	14	30/08/2017			Periodic condition monitoring	
	14	29/09/2017			Periodic condition monitoring	
	14	30/10/2017			Periodic condition monitoring	
	14	27/11/2017			Periodic condition monitoring	
	14	07/12/2017			Retest 6 months: Acidity, IFT	
	14	21/05/2018			Retest 6 months: **Dielectric and Water Content**	
	14	28/06/2018			Add inhibitor 2,6-DBPC and PASSIVATOR	
	14	24/07/2018			Periodic condition monitoring	
12	15	04/07/17	Ash Handling		Add Passivator Periodic Condition Monitoring	
	15	30/07/2017			Periodic condition monitoring	
	15	30/08/2017			Periodic condition monitoring	
	15	29/09/2017			Periodic condition monitoring	
	15	30/10/2017			Periodic condition monitoring	
	15	27/11/2017			Periodic condition monitoring	
	15	07/12/2017			Periodic condition monitoring	
	15	21/05/2018			Periodic condition monitoring	
	15	28/06/2018			Add passivator	
	15	24/07/2018			Periodic condition monitoring	
13	16	04/07/17	Ash Handling		Add Passivator Periodic Condition Monitoring	
	16	30/07/2017			Retest 6 months: **Dielectric** and **Water Content** Other parameters: Periodic Condition Monitoring	
	16	30/08/2017			Periodic Condition Monitoring	

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no	Test Cer.	Date Test	nama unit		Serial number	thn opr	Jumlah minyak, liter	Buatan	acid	ift	diel.	color	spec. Graf.	visual	sedi.	moisture ppm	moisture grade	H_2	O_2	N_2	CH_4	CO
																		hasil test				**dga ASTM**
Standard yang dipakai									ASTM D974	ASTM D971	IEC 156	ASTM D1500	ASTM D4052	ASTM D1524	ASTM D1698	ASTM D1533		hydrogen	oksigen	nitrogen	methane	carbon monoksida
								BATASAN OPERASI	< 0,06	> 32	> 30	< 3,5	> 0,84	C		< 20		< 100			< 120	< 350
	16	29/09/2017							0,022		**28**	1,5		C		**31**	B					
	16	30/10/2017							0,020		**46**	1,5		C		**21**	**C**					
	16	27/11/2017							0,022		47	1,5		C		20	**C**					
	16	07/12/2017							0,020	36,6	**24**	1,5	0,8940	C		**32**	**D**	20	15.791	63.530	5	275
	16	21/05/2018							0,020		**24**	1,5		C		**32**	**D**					
	16	28/06/2018							0,022	35,0	50	1,5	0,8811	C		16	B	32	22.904	67.139	4	249
	16	24/07/2018							0,022		27	1,5		C		**30**	**C**					
14	17	27/11/17	Trafo 1 ESP	2	10037	1010	731	Fujian	0,020		48	1,0		C		**21**	**D**					
	17	07/12/17							0,022		**22**	1,0		C		**35**	**E**					
	17	21/05/2018							0,025		**24**	1,0		C		**32**	**E**					
	17	28/06/2018							0,025	32,9	77	1,0	0,8693	C		11	B	93	17.225	43.231	5	57
	17	24/07/2018							0,028		69	1,0		C		11	B					
15	18	27/11/17	Trafo 2 ESP	2	10036	1010	731	Fujian	0,048		55	1,0		C		13	**C**					
	18	07/12/17							0,051		59	1,0		C		14	**C**					
	18	21/05/2018							0,053		55	1,0		C		16	**C**					
	18	28/06/2018							0,056	**31,3**	66	1,0	0,8573	C		13	**C**	8	22.714	64.906	5	67
	18	24/07/2018							0,059		79	1,5				8	A					
16	19	27/11/17	Trafo 3 ESP	2	10033	1010	731	Fujian	0,053		42	1,5		C		15	**D**					
	19	07/12/17							0,056		60	1,5		C		16	**D**					
	19	21/05/2018							**0,059**		51	1,5		C		18	**D**					
	19	28/06/2018							**0,062**	**26,3**	78	1,5	0,8602	C		14	**C**	14	17.627	48.672	4	47
	19	24/07/2018							**0,070**		67	1,5		C		12	B					
17	20	27/11/17	Trafo 4 ESP	2	10032	1010	731	Fujian	0,020		62	1,0		C		16	**D**					
	20	07/12/17							0,022		58	1,0		C		17	**D**					
	20	21/05/2018							0,025		40	1,0		C		18	**D**					
	20	28/06/2018							0,028	32,6	88	1,0	0,8648	C		15	**D**	22	25.201	74.464	5	85
	20	24/07/2018							0,031		59	1,0		C		13	B					
18	21	27/11/17	Main Trafo	2	1006902	2011	11.160	Wolong	0,008		70	0,5		C		16	B					
	21	07/12/17							0,008		67	0,5		C		13	A					
	21	21/05/2018							0,011		46	0,5		C		14	B					
	21	28/06/2018							0,008	42,1	75	0,5	0,8663	C		10	B	19	12.733	53.386	10	193
	21	24/07/2018							0,011		79	0,5		C		11	B					

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no	Test Cer.	Date Test	nama unit		laboratorium cennix D3612					lpf (C)		dbpc	furan	metal in oil			corr. sul	keterangan
					CO_2	C_2H_6	C_2H_4	C_2H_2	TOT	25°	100°			Al	Fe	Cu		
				Standa	carbon dioksida	ethane	ethylene	acethylene		ASTM D924		ASTM D2668	ASTM D5837	ASTM D3635			ASTM D1275B	
					< 2.500	< 65	<50	< 2	< 687	< 0.1	< 2.9	> .2	< 100	0,00	0,00	0,00		Non corrosive
	16	29/09/2017																
	16	30/10/2017																
	16	27/11/2017																
	16	07/12/2017			**2.783**	0	4	0	304	0,000	0,270	0,24	3	0,00	0,00	0,01	1A	Non corrosive
	16	21/05/2018																
	16	28/06/2018			**3.112**	0	5	0	290	0,000	0,490	0,20	0	0,00	0,00	0,02	**3 A**	**Suspec Corrosive**
	16	24/07/2018																
14	17	27/11/17	Trafo 1 ESP	2														
	17	07/12/17																
	17	21/05/2018																
	17	28/06/2018			775	0	2	0	157	0,030	3,420	0,00	0	0,00	0,06	0,03	2 C	Non corrosive
	17	24/07/2018																
15	18	27/11/17	Trafo 2 ESP	2														
	18	07/12/17																
	18	21/05/2018																
	18	28/06/2018			879	0	0	0	80	0,000	0,680	**0,00**	42	0,00	0,00	0,02	**3 A**	**Suspec Corrosive**
	18	24/07/2018																
16	19	27/11/17	Trafo 3 ESP	2														
	19	07/12/17																
	19	21/05/2018																
	19	28/06/2018			935	0	0	0	65	0,000	0,570	**0,00**	0	0,00	0,00	0,02	**3 A**	**Suspec Corrosive**
	19	24/07/2018																
17	20	27/11/17	Trafo 4 ESP	2														
	20	07/12/17																
	20	21/05/2018																
	20	28/06/2018			823	0	0	0	112	0,000	1,620	**0,01**	0	0,00	0,00	0,03	**2 C**	**Non corrosive**
	20	24/07/2018																
18	21	27/11/17	Main Trafo	2														
	21	07/12/17																
	21	21/05/2018																
	21	28/06/2018			2.448	0	2	0	224	0,000	0,410	0,22	**113**	0,00	0,00	0,03	1 B	Non corrosive
	21	24/07/2018																

TXM

no	Test Cer.	Date Test	nama unit	Standa	MALAYSIAN LAB RECOMMENDATION	PAK SOETJAHJONO (TXM ADVISOR) RECOMMENDATION
	16	29/09/2017			Retest 6 months: **Dielectric** and **Water Content**	
	16	30/10/2017			Retest 6 months: **Dielectric** and **Water Content**	
	16	27/11/2017			Periodic Condition Monitoring	
	16	07/12/2017			**Perform OIL PURIFICATION**	
	16	21/05/2018			**Perform OIL PURIFICATION**	
	16	28/06/2018			Retest 6 months: DGA Add Passivator	
	16	24/07/2018			**Perform OIL PURIFICATION**	
14	17	27/11/17	Trafo 1 ESP	2	Retest 6 months: Dielectric and Water Content	
					Other parameters: Periodic Condition Monitoring	
	17	07/12/17			**OIL PURIFICATION**	
	17	21/05/2018			**OIL PURIFICATION**	
	17	28/06/2018			**Add inhibitor 2,6-DBPC and PASSIVATOR**	
	17	24/07/2018			Periodic condition monitoring	
15	18	27/11/17	Trafo 2 ESP	2	Periodic condition monitoring	
	18	07/12/17			Retest 6 months: Acidity and IFT	
					Periodic condition monitoring	
	18	21/05/2018			Retest 6 months: **Acidity and IFT**	
	18	28/06/2018			Add inhibitor 2,6-DBPC and PASSIVATOR	
	18	24/07/2018			Periodic condition monitoring	
16	19	27/11/17	Trafo 3 ESP	2	Retest 6 months: Acidity and IFT	
					Other parameters: Periodic Condition Monitoring	
	19	07/12/17			Retest 6 months: Acidity and IFT	
					Other parameters: Periodic Condition Monitoring	
	19	21/05/2018			Retest 6 months: **Acidity and IFT**	
	19	28/06/2018			**Perform OIL REGENERATION**	
	19	24/07/2018			**Perform OIL REGENERATION**	
17	20	27/11/17	Trafo 4 ESP	2	Periodic condition monitoring	
	20	07/12/17			Periodic condition monitoring	
	20	21/05/2018			Periodic condition monitoring	
	20	28/06/2018			Add inhibitor 2,6-DBPC and PASSIVATOR	
	20	24/07/2018			Periodic condition monitoring	
18	21	27/11/17	Main Trafo	2	Periodic condition monitoring	
	21	07/12/17			Periodic condition monitoring	
	21	21/05/2018			Periodic condition monitoring	
	21	28/06/2018			Retest 6 months: **Furan and DGA** Add Passivator	
	21	24/07/2018			Periodic Condition monitoring	

Summary by Soetjahjono
TxM Indonesia