



City of Truth or Consequences
505 Sims Street
Truth or Consequences, New Mexico 87901
City (575) 894-6673 ▪ Fax (575) 894-7767

ADDENDUM #4

Thursday, July 29, 2021

PROJECT: NORTH TRANSFORMER REPLACEMENT: 10/12.5/15/16.8 MVA POWER TRANSFORMER SUPPLY, RFP# 20-21-12

Owner: City of Truth or Consequences New Mexico

This addendum forms a part of the Contract Documents and modifies the original RFP Documents. Each proposer shall acknowledge receipt of addendum number four (4) via email to procurement@torcnm.org.

Questions and Answers

1. Question – Who will de-energize the existing transformer? What method is available?

Answers – The de-energization and re-energization will be done by the successful offeror in conjunction and coordination with the City of T or C Electrical Department manager and staff.

2. Question – Who will re-energize the new transformer? What method is available?

Answers – The de-energization and re-energization will be done by the successful offeror in conjunction and coordination with the City of T or C Electrical Department manager and staff.

3. Question – Does the existing transformer oil have PCBS? Has it been tested?

Answers – Please refer to testing reports accompanying this document as ATTACHMENT #1. The city does have testing results pending that will include PCBS and will be all inclusive, Those results are anticipating to be available Friday July 30th and we will publish those as soon as available.

4. Question – How long can the transformer be offline while the replacement is being set and wired?

Answers – The time that the transformer is offline needs to be minimized as much as possible. The Electrical Department will make that installation schedule one of the first items of business to discuss with the successful offeror. The usage is somewhat dependent on the season with the highest usage during the summer months therefore the city prefers the work be done in the spring, winter or fall.

5. Question – What are the secondary connections at this time? Are they live bushings or rubber elbows into underground cable?



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Answers – The secondary connections are paddles and are pot-heads into the underground cable.

6. Question – What is the winding material of the windings? Copper or Aluminum?

Answers – The City is under the understanding that the windings are Copper.

7. Question – Can a copy of the DGA report be provided?

Answers – Yes, see ATTACHMENT #1 to this document.

8. Question – Is being a licensed contractor in New Mexico a requirement for TORC, and if so, what type of license (typically not required for utilities or power producers)?

Answers – No it is not a requirement that the contractor be licensed in New Mexico. The city will require offerors to submit in their proposal that they are qualified for this type of work.

9. Question – Does the proposal have to be turnkey through the transformer manufacturer as portrayed in the RFP, or can a contractor lead the turnkey proposal?

Answers – The proposal does not have to be turnkey through the transformer manufacture but does have to be turnkey through the entity proposing/signing as the offeror.

10. Question – Can the successful proposer be the prime contractor procuring the transformer from the manufacturer and coordinating any necessary subcontractors?

Answers – Yes

11. Question – Can field assembly and testing of the transformer be performed by the prime contractor?

Answers – Yes.

12. Question – If specifications are met, would a transformer from a different manufacturer than those listed in the RFP be acceptable?

Answers – Yes

3. Question – Is the transformer “required” to have an SPX Waukesha UZD or ABB UZE tap changer, or would an equivalent High-Speed Resistance Bridging (transition) tap change be acceptable?



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Answers – Offerors may propose value added alternatives in addition to those required in the RFP

14. Question – Will TORC accept a reconditioned or new/surplus transformer (with warranty) that closely meets the specification and is available immediately?

Answers – Offerors may propose value added alternatives in addition to those required in the RFP

15. Question – Will ANSI/NETA acceptance testing guidelines be used?

Answers – Yes

16. Question – For testing purposes, will the contractor be required to be a fully certified NETA contractor?

Answers – Yes

17. Question – If the prime contractor uses local New Mexico contractors for subcontracting work, will they be eligible for New Mexico Preference – Resident Vendor points (Factor C.7)?

Answers – No they will not

For questions regarding this Addendum, please email the Procurement Officer at:
procurement@torcnm.org.

Please reference our website for any other announcements regarding this RFP at
http://www.torcnm.org/departments/finance/public_invitation_for_bidders.php

APPENDIX A

ACKNOWLEDGEMENT OF RECEIPT OF **ADDENDUM #4** TO REQUEST FOR PROPOSAL #20-21-12

NORTH TRANSFORMER: 10/12.5/15/16.8 MVA POWER TRANSFORMER SUPPLY

This Acknowledgement of Receipt of [Addendum #4](#) should be signed and submitted via email to the Procurement Officer at procurement@torcnm.org.

In acknowledgement of receipt of this [Addendum #4](#) for Request for Proposal, the undersigned agrees that he or she has received [Addendum #4](#).

The name and address below will be used for all correspondence related to the Request for Proposal.

ORGANIZATION: _____

CONTACT
NAME: _____

TITLE: _____ PHONE NO.: _____

E-MAIL: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

Submit Acknowledgement of Receipt Form to:

To: Procurement Manager

E-mail: procurement@torcnm.org

Subject Line: Addendum #4 RFP #20-21-12 Replacement of North Transformer
Acknowledgement Form



76 Cain Drive
Brentwood, NY 11717
Phone: (631)617-5330
www.aetco.us

RFP 20-21-12 NORTH
TRANSFORMER REPLACEMENT

ATTACHMENT #1

**CITY OF TRUTH OR CONSEQUENCES
TRUTH OR CONSEQUENCES, NM**

**HOT SPRINGS SUBSTATION
REPLACE QUALITROL VALVE – NORTH TRANSFORMER
RESAMPLE OIL – NORTH TRANSFORMER**

JOB NO. L20025-0

TEST REPORT

**AET
FEBRUARY 2020**



Hot Springs Substation
Truth or Consequences, NM

Job No. L20025-0
February 2020

Objective: To replace the Qualitrol Rapid Pressure Rise Valve and perform an oil analysis on North Transformer at the Hot Springs Substation on behalf of the City of Truth or Consequences, NM.

Procedure: All work was performed in accordance with the NETA Maintenance Testing Specifications, where applicable. Oil analysis was performed using Doble Method of Procedure.

Oil was analyzed by Doble Engineering and TJ/H2B Analytical Services.

Results & Recommendations:

- North Transformer – Main - Oil Analysis

Dissolved Gas

High temperature overheating and overheating of cellulose

Oil Quality – The water content as reported in relative saturation is wet for in-service oil.

Recommendation: Re-energize North transformer and re-sample oil in 3 months.

- North Transformer – LTC – Oil Analysis

Dissolved Gas – LTCare condition of no immediate concern.

Oil Quality – Acceptable for LTC.

Recommendation: Resample in one year if loaded below nameplate rating. Resample in four-six months if loaded above nameplate ratings.



LABORATORY ANALYSIS REPORT

Customer	Sample	Report
Company: American Electrical Testing Main Contact: Jeff Somol Address: 25 Forbes Blvd Unit 1 Foxboro, MA 02035-2873 E-mail: jsomol@aetco.us	ID No: 236541-001 Date Sampled: 02/25/2020 Date Received: 02/26/2020 Work Order: Purchase Order: 033468 Task No:	Lab Order No: 236541 Revision: Date Issued: 02/27/2020 Laboratory: Indianapolis, IN Authorized By: ccampbell

EQUIPMENT INFORMATION

Substation: HOT SPRINGS Serial No: 19090100 Design Type: Core Type No of Phases: N Manufacturer: General Electric Preservation: Gas Blanketed Alarm Set:	Equipment No: Maximum MVA: 14 Cooling: OA/FA Phase Name: Yr Manufactured: 2001 XFMR/TRN Type: Transformer	Equipment Type: XFMR Transformer Name: NORTH Maximum KV: 115.00 Max. Temp Rise: 65 Insulant Type: Mineral Volume: 4400 Units: Gallons
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SAMPLING INFORMATION

Syringe No: 0114 Container No: 1 Miscellaneous ID: H881685A Reason for Testing:	Sample Date: 02/25/2020 Sampled By: Time: 10:00 am Secondary Name:	Top Oil Temp (C): 12 Humidity: 38.00 Ambient Temp (C): 10 Sample Point: Main Tank Bottom
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CRITICALITY and RESAMPLE FREQUENCY

Criticality: Moderate
Resample Frequency: 3 months

Dissolved Gas Analysis

High temperature overheating of oil and cellulose.

Oil Quality Tests

The water content as reported in relative saturation is wet for in-service oil. The water content as reported in relative saturation is high and should be resampled to confirm the reading, making sure to flush 1-2 gallons (4-8 liters) of oil from the valve before taking the sample. Other results are acceptable.



LABORATORY ANALYSIS REPORT

Dissolved Gas Analysis

Serial No: 19090100

19090100

NORTH TRANSFORMER

Dissolved Gas Analysis

		2/25/2020	1/10/2020	2/6/2017	6/7/2016
Sample Date:	ASTM D3612 IEC 60567	2/25/2020	1/10/2020	2/6/2017	6/7/2016
Analysis Date:	ASTM D3612 IEC 60567	2/27/2020	2/7/2020		
Sample Point:	ASTM D3612 IEC 60567	Bottom	Bottom	Bottom	Bottom
Sample No:	ASTM D3612 IEC 60567	1	3	1	1
Doble Sample Id:	ASTM D3612 IEC 60567	236541-001	235728-003	179934-001	167371-001
Report ID:	ASTM D3612 IEC 60567	236541	235728	179934	167371
Top Oil Temp (C):	ASTM D3612 IEC 60567	12	25	25	30
Hydrogen (H2) (ppm)	ASTM D3612 IEC 60567	10.5 [^]	9.2 [^]	5.8	7.1
Oxygen (O2) (ppm)	ASTM D3612 IEC 60567	<50.0 [^]	237 [^]	453	628
Nitrogen (N2) (ppm)	ASTM D3612 IEC 60567	62600 [^]	68100 [^]	63900	60200
Methane (CH4) (ppm)	ASTM D3612 IEC 60567	31.4 [^]	27.2 [^]	14.0	14.0
Carbon Monoxide (CO) (ppm)	ASTM D3612 IEC 60567	778 [^]	754 [^]	744	809
Ethane (C2H6) (ppm)	ASTM D3612 IEC 60567	23.1 [^]	8.5 [^]	4.3	3.8
Carbon Dioxide (CO2) (ppm)	ASTM D3612 IEC 60567	5327 [^]	5301 [^]	4830	4801
Ethylene (C2H4) (ppm)	ASTM D3612 IEC 60567	36.0 [^]	31.2 [^]	16.0	14.0
Acetylene (C2H2) (ppm)	ASTM D3612 IEC 60567	1.7 [^]	1.6 [^]	0.0	0.0
Total Gas (ppm)		68858 [^]	74470 [^]	69967	66474
Comb. Gas (ppm)		881 [^]	832 [^]	784	848
Est. TCG, % of Gas Space		0.97 [^]	0.86 [^]	0.88	1.02
Ethylene-Acetylene Ratio		21.18 [^]	19.50 [^]	0.00	0.00
PPM/Day (ppm/day)		1.1	0.0		

Oil Quality Tests

Serial No: 19090100

19090100

NORTH TRANSFORMER

Oil Quality Tests

		2/25/2020	1/10/2020	2/6/2017	6/7/2016
Sample Date:	D1533 IEC 60814	2/25/2020	1/10/2020	2/6/2017	6/7/2016
Analysis Date:	D1500	2/27/2020	2/7/2020		
Sample Point:	D1816	Bottom	Bottom	Bottom	Bottom
Sample No:	D971	1	3	1	1
Doble Sample Id:	D974	236541-001	235728-003	179934-001	167371-001
Report ID:	D924	236541	235728	179934	167371
Top Oil Temp (C):	D4052	12	25	25	30
Water Content (ppm)	D1298	12 [^]	6 [^]	3	8
Relative Saturation (%)	D1524	30.8 [^]	8.9 [^]	4	10
Color D1500		L1.5 [^]	L1.5 [^]	L 1.5	L 1.5
Dielectric, D 1816, 1mm gap (kV)		26 [^]	37 [^]	45	34
Interfacial Tension (mN/m)		34 [^]	34 [^]	34	34
Neut. Number (mgKOH/g)		0.02 [^]	0.01 [^]	0.02	0.03
Power Factor @ RT (%)		0.041 [^]	0.035 [^]	0.057	0.051
Power Factor @ 100°C (%)		1.362 [^]	2.514 [^]	4.600	2.022
Specific Gravity By D4052 (60/60)		0.8902 [^]	0.8894 [^]		
Specific Gravity (Rel. Density) (60/60)				0.889	0.888
Visual Examination		C&B [^]	C&B [^]	C&B	C&B-FewP

Doble Engineering Marlborough, MA, Indianapolis, IN, Morrisville, NC or Morgan Schaffer is an ISO/IEC 17025 accredited laboratory

The analyses contained in this report are based upon material and information supplied by the customer. Doble Engineering does not imply that the contents of the sample received at its laboratory are the same as all such material in the environment from which the sample was taken. Our test results only relate to the sample(s) tested. Doble Engineering assumes no responsibility and makes no warranty or representation as provided in the Doble Terms and Conditions Revision 101816. This report must not be reproduced, unless in its entirety, without the written consent of Doble Engineering. (*Accredited Tests, tSubcontracted Tests).



LABORATORY ANALYSIS REPORT

Customer	Sample	Report
Company: American Electrical Testing Main Contact: Jeff Somol Address: 25 Forbes Blvd Unit 1 Foxboro, MA 02035-2873 E-mail: jsomol@aetco.us	ID No: 236541-002 Date Sampled: 02/25/2020 Date Received: 02/26/2020 Work Order: Purchase Order: 033468 Task No:	Lab Order No: 236541 Revision: Date Issued: 02/27/2020 Laboratory: Indianapolis, IN Authorized By: ccampbell

EQUIPMENT INFORMATION

Transformer S/N: 19090100 LTC Equipment No: Substation: HOT SPRINGS Manufacturer: General Electric Model: LRT-200 Insulant: Mineral Volume: 4400 Units: Gallons	Equipment Type: LTC LTC S/N: Transformer Name: NORTH Compartment: Type: Vacuum Tank Type: Free Breathing Transformer Type: Vacuum Regulator Contacts:
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SAMPLING INFORMATION

Syringe No: 0186 Container No: 2 Miscellaneous ID: H881685A Reason for Testing:	Sample Date: 02/25/2020 Sampled By: Time: 10:30 am Secondary Name:	Top Oil Temp (C): 12 Humidity: 38.00 Ambient Temp (C): 10 Sample Point: LTC
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CRITICALITY and RESAMPLE FREQUENCY

Criticality: Low
Resample Frequency: 1 year

Dissolved Gas Analysis

LTCare Condition Code 5 - Condition is of no immediate concern. Resample 1 year if loaded below nameplate rating, 4-6 months if loaded above nameplate ratings.

Oil Quality Tests

Acceptable for LTC.



LABORATORY ANALYSIS REPORT

Dissolved Gas Analysis

Serial No: 19090100

19090100

H881685A

Dissolved Gas Analysis

		2/25/2020	1/10/2020	2/6/2017	6/7/2016
Sample Date:	ASTM D3612 IEC 60567	9.1^	7.0^	6.0	7.4
Analysis Date:	ASTM D3612 IEC 60567	7150^	16500^	15100	20700
Sample Point:	ASTM D3612 IEC 60567	48600^	61800^	47400	47700
Sample No:	ASTM D3612 IEC 60567	7.60^	6.45^	5.20	4.60
Doble Sample ID:	ASTM D3612 IEC 60567	214^	171^	147	154
Report ID:	ASTM D3612 IEC 60567	1.2^	1.0^	0.9	0.7
Top Oil Temp (C):	ASTM D3612 IEC 60567	3645^	3633^	2970	2625
Hydrogen (H2) (ppm)	ASTM D3612 IEC 60567	1.8^	1.6^	1.6	1.2
Oxygen (O2) (ppm)	ASTM D3612 IEC 60567	0.8^	0.7^	0.6	Trace
Nitrogen (N2) (ppm)		59630^	82121^	65631	71191
Methane (CH4) (ppm)		235^	188^	161	168
Carbon Monoxide (CO) (ppm)		0.34^	0.20^	0.22	0.22
Ethane (C2H6) (ppm)		2.25^	2.29^	2.67	0.00
Carbon Dioxide (CO2) (ppm)		1.0	0.0		
Ethylene (C2H4) (ppm)					
Acetylene (C2H2) (ppm)					
Total Gas (ppm)					
Comb. Gas (ppm)					
Est. TCG, % of Gas Space					
Ethylene-Acetylene Ratio					
PPM/Day (ppm/day)					

Oil Quality Tests

Serial No: 19090100

19090100

North XFMR-LTC

Oil Quality Tests

		2/25/2020	1/10/2020	2/6/2017	6/7/2016
Sample Date:	D1533 IEC 60814	7^	14^	17	20
Analysis Date:		17.9^	20.7^	25	24
Sample Point:	D1500	0.5^	L1.0^	L 1.0	L 1.0
Sample No:	D1816	26^	37^	39	22
Doble Sample ID:	D971	42^	41^	44	45
Report ID:	D974	<0.01^	0.01^	< 0.01	0.01
Top Oil Temp (C):	D924	0.010^	0.005^	0.020	0.029
Water Content (ppm)	D924	0.309^	0.461^	0.560	0.635
Relative Saturation (%)	D4052	0.8948^	0.8937^		
Color D1500	D1298			0.890	0.894
Dielectric, D 1816, 1mm gap (kV)	D1524	C&B^	C&B^	C&B	C&B-FewP
Interfacial Tension (mN/m)					
Neut. Number (mgKOH/g)					
Power Factor @ RT (%)					
Power Factor @ 100°C (%)					
Specific Gravity By D4052 (60/60)					
Specific Gravity (Rel. Density) (60/60)					
Visual Examination					

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Dissolved Gas Analysis

ASTM D3612-C

Pat DeVita
 American Electrical Testing Co.
 76 Cain Drive
 Brentwood, NY 11717

Location : Hot Springs
 Bank Phase : North XFMR
 Serial Number : 19090100
 Manufacturer : US West
 Equipment Type : Transformer
 Model :

Date: 02-27-2020
 Report Number: 1352802
 P.O. Number: 200206
 Year of Mfg : 2001
 kV Rating : 115
 Breathing : Gas Blanketed - Sealed
 Cooling : OA/FA
 Fluid type : Mineral Oil
 Fluid Volume : 4400

Sample Date :	2/25/2020
Laboratory No. :	1352802
Container No. :	OXO
Temperature :	12.2
Hydrogen (ppm) :	9
Methane (ppm) :	27
Ethane (ppm) :	17
Ethylene (ppm) :	34
Acetylene (ppm) :	1
Carbon monoxide (ppm) :	748
Carbon dioxide (ppm) :	6121
Nitrogen (ppm) :	83650
Oxygen (ppm) :	5226
Total (ppm) :	95833
Total (%) :	9.58
TDCG (ppm) :	836
TDCG Rate (ppm/day) :	0.0
ETCG (% in blanket) :	0.65
CH4 / H2 :	3.08
C2H2 / C2H4 :	0.04
C2H2 / CH4 :	0.06
C2H6 / C2H2 :	11.37
C2H4 / C2H6 :	2.01
CO2 / CO :	8.18

Dissolved Gas Diagnostics

IEEE Std. C57.104-2008

Condition : 3
 Key Gas Method : All gases are within normal limits
 Not in table
 Rodgers Ratios (3) : Thermal <700 C Note that some ratio gases are below meaningful thresholds.
 Rodgers Ratios (4) : Not in table. Note that some ratio gases are below meaningful thresholds.
 CO2 / CO : Higher than normal temperature in insulation
 Heat Index : 0.01
 TDCG Level (ppm) : 836
 TDCG Rate (ppm/day) : 0.0
 Sampling Interval :
 Operating Procedure : Repeat test immediately to establish trend. Fault(s) are probably present



Dissolved Gas Analysis

ASTM D3612-C

Pat DeVita
American Electrical Testing Co.

76 Cain Drive
Brentwood, NY 11717

Location : Hot Springs
Bank Phase : North XFMR
Serial Number : 19090100
Manufacturer : US West
Equipment Type : Transformer
Model :

Date: 02-27-2020
Report Number: 1352802
P.O. Number: 200206
Year of Mfg. : 2001
kV Rating : 115
Breathing : Gas Blanketed - Sealed
Cooling : OA/FA
Fluid type : Mineral Oil
Fluid Volume : 4400

TJ|H2b Analytical Services issues reports in a simplified manner; not all ASTM and ISO/IEC 17025 requirements are addressed in this report; however, all required information is retained and available upon request. TJ|H2b does not perform sampling services and provides results for tests performed on samples as received. TJ|H2b assumes no responsibility for the quality or condition of the samples it receives or for the accuracy of any information provided with those samples. Test reports shall not be reproduced, except in full, without prior written consent of TJ|H2b.

Approved by:

Michelle Kutzleb, PhD
Director of Operations



Insulating Fluid Evaluation

Pat DeVita
American Electrical Testing Co.

76 Cain Drive
Brentwood, NY 11717

Location : Hot Springs
Bank & Phase : North XFMR
Serial Number : 19090100
Manufacturer : US West
Equipment Type : Transformer
Model :
Year of Mfg. : 2001

Date : 2/27/2020
Report Number : 1352802
P.O. Number : 200206
kV Rating : 115
Breathing : Gas Blanketed - Sealed
Cooling : OA/FA
Fluid type : Mineral Oil
Fluid Volume : 4400

Sample Date : 2/25/2020
Laboratory Number : 1352802
Container Number : OXO
Temperature : 12.2
D1533 Moisture (ppm) : 21
D971 Interfacial Tension (mN/m) : 29.3
D974 Acid Number (mg KOH/g) : 0.02
D1500 Color Number (ASTM) : <1.5
D1524 Visual Examination : **Clear & Bright**
D877 Dielectric BV (kV) :
D1816 Dielectric BV (kV) : 33
D924 Power Factor (% at 25 C) : 0.044
D924 Power Factor (% at 100 C) : 1.719
D2668 Oxidation Inhibitor (%) :
D1298 Specific Gravity : 0.888
D88 Viscosity (SUS) :
D97 Pour Point (C) :
D92 Flash Point (C) :
D92 Fire Point (C) :
D1807 Refractive Index :
D1275 Corrosive Sulfur :

Insulating Fluid Diagnostics

	ASTM D3487	IEEE Group I	<69	>69<288	>345	IEEE Group II	IEEE Group III
Moisture :	35 max	Acceptable	35 max	25 max	20 max		
Interfacial Tension :	40 min	Warning	25 min	30 min	32 min	Acceptable 24 min	Acceptable 16 min
Acid Number :	0.03 max	Acceptable	0.2 max	0.15 max	0.1 max	Acceptable 0.2 max	Acceptable 0.5 max
Color Number :	0.5 max						
Visual Examination :	clear & bright						
Dielectric BV D877 :	30 min		25 min	25 min	25 min		
Dielectric BV D1816 :	28 min	Acceptable	23 min	28 min	30 min		
Power Factor @ 25 C :	0.05 max						
Power Factor @ 100 C :	0.30 max						
Oxidation Inhibitor :	0.3 max						
Specific Gravity :	0.91 max						
Viscosity @ 40 C :	66 max						
Pour Point :	-40 max						
Flash Point :	145 min						
Fire Point :							
Refractive Index :							
Corrosive Sulfur :	noncorrosive						

Comments : Percent Saturation = 53



Insulating Fluid Evaluation

Pat DeVita
American Electrical Testing Co.

76 Cain Drive
Brentwood, NY 11717

Location : Hot Springs
Bank & Phase : North XFMR
Serial Number : 19090100
Manufacturer : US West
Equipment Type : Transformer
Model :
Year of Mfg. : 2001

Date : 2/27/2020
Report Number : 1352802
P.O. Number : 200206
kV Rating : 115
Breathing : Gas Blanketed - Sealed
Cooling : OA/FA
Fluid type : Mineral Oil
Fluid Volume : 4400

TJ|H2b Analytical Services issues reports in a simplified manner; not all ASTM and ISO/IEC 17025 requirements are addressed in this report; however, all required information is retained and available upon request. TJ|H2b does not perform sampling services and provides results for tests performed on samples as received. TJ|H2b assumes no responsibility for the quality or condition of the samples it receives or for the accuracy of any information provided with those samples. Test reports shall not be reproduced, except in full, without prior written consent of TJ|H2b.

Approved by:

A handwritten signature in black ink, appearing to read 'MKutzleb', written over a horizontal line.

Michelle Kutzleb, PhD
Director of Operations



Dissolved Gas Analysis

for LTC's and Regulators

ASTM D3612-C

Pat DeVita
American Electrical Testing Co.

76 Cain Drive
Brentwood, NY 11717

Location : Hot Springs
Bank & Phase : North XFMR LTC
Equipment ID : H881685A
Manufacturer : GE
Equipment Type : LTC - free breathing
Tank : Vacuum
Model : LRT-200

Date : 2/27/2020
Report Number : 1352803
Counter :
Operations :
EIR Contacts :
Online Filter :
Oil Filtered :
Oil Replaced :
Contacts Replaced :

Sample Date :	2/25/2020
Laboratory No. :	1352803
Container No. :	166
Temperature :	12.2
Hydrogen (ppm) :	7
Methane (ppm) :	6
Ethane (ppm) :	1
Ethylene (ppm) :	2
Acetylene (ppm) :	1
Carbon monoxide (ppm) :	198
Carbon dioxide (ppm) :	4170
Nitrogen (ppm) :	70469
Oxygen (ppm) :	12026
Total (ppm) :	86880
Total (%) :	8.69
TDCG (ppm) :	215
TDCG Rate (ppm/day) :	0.0
ETCG (% in blanket) :	0.20
CH4 / H2 :	0.99
C2H2 / C2H4 :	0.31
C2H2 / CH4 :	0.09
C2H6 / C2H2 :	1.85
C2H4 / C2H6 :	1.73
CO2 / CO :	21.01

Dissolved Gas Diagnostics

Key Gas Method : All gases are within normal limits
Doernenburg Ratios : Not in table
Rodgers Ratios (3) : Not in table. All ratio gases are below meaningful thresholds.
Rodgers Ratios (4) : General Conductor Overheating All ratio gases are below meaningful thresholds.
CO2 / CO :
Heat Index : 0.00
Sampling Interval :
Operating Procedure : Normal heating. Continue normal operation

Comments :



Dissolved Gas Analysis

for LTC's and Regulators

ASTM D3612-C

Pat DeVita
American Electrical Testing Co.

76 Cain Drive
Brentwood, NY 11717

Location : Hot Springs
Bank & Phase : North XFMR LTC
Equipment ID : H881685A
Manufacturer : GE
Equipment Type : LTC - free breathing
Tank : Vacuum
Model : LRT-200

Date : 2/27/2020
Report Number : 1352803
Counter :
Operations :
EIR Contacts :
Online Filter :
Oil Filtered :
Oil Replaced :
Contacts Replaced :

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Approved by:

Michelle Kutzleb, PhD
Director of Operations



Insulating Fluid Evaluation

Pat DeVita
American Electrical Testing Co.

76 Cain Drive
Brentwood, NY 11717

Location : Hot Springs
Bank & Phase : North XFMR LTC
Serial Number : H881685A
Manufacturer : GE
Equipment Type : LTC - free breathing
Model : LRT-200
Year of Mfg. :

Date : 2/27/2020
Report Number : 1352803
P.O. Number : 200206
kV Rating :
Breathing : LTC - free breathing
Cooling :
Fluid type : Mineral Oil
Fluid Volume : 150

Sample Date : 2/25/2020
Laboratory Number : 1352803
Container Number : 166
Temperature : 12.2
D1533 Moisture (ppm) : 16
D971 Interfacial Tension (mN/m) : 36.9
D974 Acid Number (mg KOH/g) : <0.02
D1500 Color Number (ASTM) : <1.0
D1524 Visual Examination : Clear & Bright
D877 Dielectric BV (kV) :
D1816 Dielectric BV (kV) : 30
D924 Power Factor (% at 25 C) : 0.010
D924 Power Factor (% at 100 C) : 0.519
D2668 Oxidation Inhibitor (%) :
D1298 Specific Gravity : 0.889
D88 Viscosity (SUS) :
D97 Pour Point (C) :
D92 Flash Point (C) :
D92 Fire Point (C) :
D1807 Refractive Index :
D1275 Corrosive Sulfur :

Insulating Fluid Diagnostics

	ASTM D3487	IEEE Group I	<69	>69<288	>345	IEEE Group II	IEEE Group III
Moisture :	35 max	Acceptable	35 max	25 max	20 max		
Interfacial Tension :	40 min	Acceptable	25 min	30 min	32 min	Acceptable 24 min	Acceptable 16 min
Acid Number :	0.03 max	Acceptable	0.2 max	0.15 max	0.1 max	Acceptable 0.2 max	Acceptable 0.5 max
Color Number :	0.5 max						
Visual Examination :	clear & bright						
Dielectric BV D877 :	30 min		25 min	25 min	25 min		
Dielectric BV D1816 :	28 min	Acceptable	23 min	28 min	30 min		
Power Factor @ 25 C :	0.05 max						
Power Factor @ 100 C :	0.30 max						
Oxidation Inhibitor :	0.3 max						
Specific Gravity :	0.91 max						
Viscosity @ 40 C :	66 max						
Pour Point :	-40 max						
Flash Point :	145 min						
Fire Point :							
Refractive Index :							
Corrosive Sulfur :	noncorrosive						

Comments : Percent Saturation = 41



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Approved by:

A handwritten signature in black ink, appearing to read 'MKutzleb', written over a horizontal line.

Michelle Kutzleb, PhD
Director of Operations