W.O 71543A1100

P.I. No 140650914

(8)

Annexure - II
ON Line Dissolved Gas Analysis
Technical Specification For On Line Gas In Oil Analyser

1.0 GENERAL:

The transformer shall be equipped with on line gas in oil analyzer system and remote data transfer /communications. It is intended to individual monitor the evolution of dissolved gases from the oil of transformer to detect and continuously monitor a individual value of gases like H2(Hydrogen), CH4 (Methane),C2H4 (ethylene),C2H6 (Ethane), C2H2 (Acetylene), CO2 (Carbon dioxide), CO (Carbon monoxide).,O2 Oxygen,N2 (Nitrogen).The system shall be installed on a single, open bore ball or gate valve.

2.0 SCOPE of WORK:

The scope of work shall be to supply, mounting, erection, commissioning, etc; for on line moisture and gas in oil analyzer system of any transformer in GETCO.

2.1 Microprocessor based Intelligent Electronic Device (IED), as required, to be on a single open bore ball or gate valve mounted on transformer along with all required fittings and accessories.

2.2 One set of centralized monitoring system with suitable software for communicating with IEDs simultaneously with a provision for communicating to two or more IEDs if required in future. The required software shall be loaded in GETCO system at desired location such that all the data/display associated with the system can be visualized and all archiving / trending can be achieved. It shall also give printouts of all required data as desired.

2.3 All required interconnection, wiring, cabling with fiber optic cables/RS 485 cables etc., including all required accessories for successful operation of the system.

2.4 Required earthing & connection for the system at required location is to be carried out by bidder.

2.5 Necessary tools, tackles, calibration equipments, installation Material, required for successful operation of the system is to be carried out by bidder. ***Tools required for erection are on returnable basis.***

12/10/15

2.6 To supply installation, commissioning and O&M manuals and procedures, etc., in hard and soft form.

2.7 To supply standard HOST/User Interface Software in ENGLISH, one with each unit on a CD – ROM.

2.8 The system interface shall also include required field cable, patch cable, patch box, associated accessories & hardware's to connect to the GETCO system as required.

2.9 Training to GETCO Engineers.

3.0 SPECIFIC TECHNICAL REQUIREMENT:

3.1 Intelligent Electronic Device (IED):

The IEDs shall be suitable for outdoor heavily polluted atmosphere, ambient temperature of 55 degree C and relative humidity of 100 % and shall have minimum degree of protection of IP-55. Necessary type test reports shall be submitted with the bid. **Each IED shall be provided with additional canopy**. The IED shall be suitable for mounting on offered transformer. **The best single point of mounting location to ensure optimum flow of oil in the IED without any external / additional pump & piping shall be decided in co ordination with on line gas in oil analyzer system manufacturer**.

The system shall operate satisfactorily for oil temperature range of -5 to 120 degree C with heat fin adapter and shall be suitable for oil pressure of 100 psi. Provision shall be made available for collection oil samples for DGA and moisture analysis, without disturbing IED or its connections. It shall be possible to carry out the periodic maintenance easily. The normal functioning of IED shall be guaranteed ***with or*** without necessity of any additives / consumable. ***Bidder shall supply such additive or consumable within guarantee period free of cost as and when required to GETCO site where it is provided.*** The IED shall include an automatic 'self-test' feature ***otherwise calibration shall be arranged by bidder free of cost by providing spare unit as and when required.***

It shall be possible to down load all information locally and remotely by a PC/ laptop computer. All the information shall also be continuously transmitted to centralized monitoring GETCO system. Necessary serial

interfaces shall be provided. **The IED shall be electromagnetically screened and impervious to vibrations.**

3.2 Centralized Monitoring System:

The centralized monitoring system shall be installed in GETCO server for continuous display recording and archiving of information received from all IEDs with a provision for receiving information from future IEDs also. The soft ware shall have menu driven pass word protected real time operating system with self-diagnostic feature. The soft ware shall be suitable for graphical display of gas evolution with daily and hourly trending as well as historical data and event recording. It shall be required to obtain audio visual alarm with suitable multiple thresholds for dissolved gas level 'HIGH', "HIGH - HIGH", 'FAIL'. It shall also possible to configure the IEDs from the centralizing system as well as local.

3.3 Interconnecting Cabling:

Glass Fiber Optic mono mode cables /RS485 cable shall be provided for interconnection of all IEDs and the central monitoring system. The cable shall be laid in HDPE conduits. All required terminations, splicing kits shall be arranged by bidder. Provision shall be kept for installing and terminating cables from future IEDs. It is also intent to monitor gas in oil of transformer through internet. There will not be any wire connection. It will be wireless communication. Any suitable modem shall be provided. Data is to be seen and analyze at corporate office or any other remote locations as desired by GETCO.

4.0 List of routine & acceptance tests shall be submitted with the technical bid. Successful bidder has to perform acceptance tests in presence of GETCO representative, as per relevant standard.

5.0 Services of on line moisture and gas in oil analyzer system supplier during supply, mounting, erection, testing, commissioning and after sales even beyond guarantee period shall have to be arranged and provided by the bidder.

6.0 The bidder shall furnish all guaranteed technical particulars as called for in this specification. Bid not containing this information are likely to be rejected.

7.0 The unit can be fitted to any transformer as per need/requirement of GETCO.

8.0 It can be shifted from one place to other place as per our need.

9.0 Guarantee for the unit should be 36 months from date of installation or 42 months from the date of supply whichever is earlier. It is submitted in the form of Performance bank Guarantee in 10% of the value.

10.0 The unit is needed within six months.

11.0 Deviation from Specification:
All deviations from this specification shall be separately listed in specified Schedule, in the absence of which, it will be presumed that the provision of the specification are complied with by the bidder.

PRINCIPAL TECHNICAL PARAMETRS OF On line DGA & moisture Analyzer Kit

<table>
<tr><th>SR. NO.</th><th>Item</th><th>Specification</th></tr>
<tr><td>1</td><td>On line DGA analyzer kit</td><td>
On line DGA analyzer kit
1. Be capable for detecting on line gases (individually each gas) from oil of transformer.
The system shall be installed on a single, open bore ball or gate valve.
2. Have rugged and reliable design to have field use.
3. It can be shifted from one place to other place as per our need
4. Have self calibration feature.
5. The unit can be fitted to any transformer as per need/requirement of GETCO.
6. Services of on line gas in oil analyzer system during supply, mounting, erection, testing, commissioning and after sales even beyond guarantee period shall have to be arranged and provided by the bidder.
7. One set of centralized monitoring system with suitable software for communicating with IEDs simultaneously with a provision for communicating to two or more IEDs if required in future. The required software shall be loaded in GETCO system at desired location such that all the data/display associated with the system can be visualized and all archiving / trending can be achieved. It shall also give printouts of all required data as desired.
8. Training to GETCO Engineer.
9. Maintenance on transformer as well as oil sample can be easily taken without disturbing unit.
Technical Parameters
<table>
<tr><td>Power supply:</td><td>230V AC± 15%, 50Hz ± 5%</td></tr>
<tr><td>Measurement of gases</td><td>H2,CH4,C2H6,C2H4,C2H2,CO,CO2,O2,N2</td></tr>
<tr><td>Minimum Detection range</td><td>5 PPM – 3000 PPM for H2
5 PPM – 7000 PPM for CH4
5 PPM – 5000 PPM for C2H6
3 PPM – 5000 PPM for C2H4
1 PPM – 3000 PPM for C2H2
10 PPM – 10000 PPM for CO
20 PPM – 20000 PPM for CO2</td></tr>
<tr><td>Oil Temp.</td><td>10 to 120 degree c</td></tr>
<tr><td>Operating temperature</td><td>-10 to 55 degree c</td></tr>
</table>
</td></tr>
</table>

		Oil sampling method	On line
		Accuracy	5% or + LDL(Lower detection Limit) whichever is greater
		Measuring time	On line continuous process
		Communication	Rs 485,Rs 232,Modbus,IEC 61850

Data management

Software:	Window based, suitable for Data analysis of measuring results.
Display:	External PC or laptop
Storage:	Simple xml format
PC communication:	RS232 or equivalent port
Software analysis :	Key gas method, Rogers ratio & Duval triangle

Environmental

Operating temp:	-10 to 55 deg. C
Humidity:	100% RH, Non condensing

10) Interface and analysis software shall be provided to operate the test set from PC/Laptop & analyze the results. The software should provide automatic temperature correction.

11) Along with DGA instrument, laptop as per following specification, shall be supplied with carry case;

1) *Intel core 2 Duo P8400 – 2.26 GHz processor, 3 MB L2 Cache Memory 1066 MHz FSB*
2) *250 GB SATA HDD*
3) *2 GB DDR2 RAM*
4) *15.4" WXGA TFT Display (1200 x 800 pixels)*
5) *LAN card*
6) *Combo Drive (DVD R/W, CD R/W)*
7) *USB port*
8) *RS 232, RJ 45 ports*
9) *Optical scroll mouse*
10) *Loaded with Windows XP/ Vista - License version*
11) *Loaded with MS Office 2007 – License Version (life time)*

12) Loaded with compatible antivirus – 3 year License

GUARANTEED TECHNICAL PARTICULARS FOR ON LINE GAS IN OIL ANALYZER

(TO BE FILLED IN BY THE TENDERER AND FURNISH WITH TECHNICAL BID)

The GTP is to be filled up in this format and, in the page of Tender Specification only, to be submitted in duplicate along with the offer. This is intended for speedy comparison of various bidders GTP. The Tenderer shall fill in the particulars against appropriate items in respect of each rating.

Sr. No.	Description of Technical Parameter of the particular Kit / Equipment	Rating/ Range
1	Power requirements	
2	Measurement of gases	
3	Minimum Detection limit	
4	Dimensions and weight	
5	Oil Temp.	
6	Operating temperature	
7	Humidity	
8	Technology	
9	Oil sampling method	
10	Extraction method	
11	Extraction time	
12	Accuracy	
13	GS separating Column	
14	Sensor type	
15	Carrier Gas (If required) Yes/No	
16	Name of carrier Gas with consumption of gas per sample	
17	Communication	

18	Data download software	
19	Software analysis as per Key gas method, Rogers ratio & Duval triangle	
20	Calibration required	
21	Can shift from one place to other	

Corrignedum-1

ON LINE DGA

Point No. 1: Online DGA parameter kit:
Be capable for detecting On line gases (Individually each Gas) from oil of transformer. The system shall be installed on a single, open bore ball or gate valve. However, if the bidder desires for additional valve in view of closed loop system, he can offer for the same.

Sub Point No. 9:
Technical parameters table

Measurement of gases be read as under

(A) Mandatory: H2, CH4, C2H6, C2H4, C2H2, CO, CO2 individually with measurement of moisture.

(B) Optional Gases: O2 & N2

Page No. 3
Point No. 1:
Intelligent Electronic Device (IED)
Specific technical requirement (On line DGA)

Please add following sentence after completion of first para:
"However, if the bidder desires floor mounting IED system on a movable trolley can offer for the same."

Page No. 3
Point No. 3:
Specific technical requirement (On line DGA),
Interconnecting cabling

Please replace first sentence by following sentence:
"Glass Fiber Optic mono mode cables /RS485 cable/ armored instrumentation cable shall be provided for interconnection of all IEDs and the central monitoring system."

Page No. 4
Point no. 9 & 10 are not applicable.

(अमित करमचन्दानी)
(AMIT KARAMCHANDANI)