
	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: 053 - 073 - 9184	TBE FOR TRANSFORMERS							شماره صفحه : 1 از 25	
	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	EL	TB	0001		D00

طرح نگهداشت و افزایش تولید 27 مخزن



TBE FOR TRANSFORMERS

نگهداشت و افزایش تولید میدان نفتی بینک

D00	Nov. 2023	IFI	H.Shakiba	M.Fakharian	S.Faramarzpour	
Rev.	Date	Purpose of Issue/Status	Prepared by:	Checked by:	Approved by:	Client Approval
Class:3		Client Doc. Number: F0Z-709328				

Status:

IDC: Inter-Discipline Check
 IFC: Issued For Comment
 IFA: Issued For Approval
 AFD: Approved For Design
 AFC: Approved For Construction
 AFP: Approved For Purchase
 AFQ: Approved For Quotation
 IFI: Issued For Information
 AB-R: As-Built for Client Review
 AB-A: As-Built –Approved

	<p>نگهداشت و افزایش تولید میدان نفتی بینک</p> <p>سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
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نگهداشت و افزایش تولید میدان نفتی بینک
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شماره پیمان:

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TBE FOR TRANSFORMERS

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D00	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه: 3 از 25

TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
1. General								
1.1	Manufacturer's Name	By Vendor	Iran Transfo	A	Kian Transfo	A	Aria Transfo	A
1.2	Transformer Tag Number	GCS-TR-001 & GCS-TR-002	OK	A	OK	A	OK	A
1.3	Quantity	2	OK	A	OK	A	OK	A
1.4	Standard	IPS-M-EL-152 (3) BK-GNRL-PEDCO-000-EL-SP-0004	OK	A	OK	A	OK	A
1.5	Kind/Construction of Transformer	Oil Immersed, Hermetically Sealed With Pillow Nitrogen, Separate High & Low Windings, Two Winding	OK	A	OK	A	OK	A
1.6	Rated Power in Service Condition	1250 kVA	OK	A	OK	A	OK	A
1.7	Supply Frequency	50 Hz \pm 5 %	OK	A	OK	A	OK	A
1.8	Winding Connection/Vector Group	Dyn11	OK	A	OK	A	OK	A
1.9	Location	Outdoor Under Shelter, Safe Area	OK	A	OK	A	OK	A
1.10	Primary Winding Rated Voltage	11kV	OK	A	OK	A	OK	A
1.11	Secondary Winding Rated Voltage	0.42 KV	OK	A	OK	A	OK	A
1.12	Tapping Range	\pm 5%, \pm 2.5% & 0 , Off Load	OK	A	OK	A	OK	A
1.13	Tapping Place	On HV Winding	OK	A	OK	A	OK	A



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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
2. Environmental Conditions (Process Basis Of Design, BK-GNRAL-PEDCO-000-PR-DB-0001)								
2.1	Ambient Temperature Range	0 ~ 52°C	OK	A	OK	A	OK	A
2.2	Installation Elevation	12m (Above Sea Level)	OK	A	OK	A	OK	A
2.3	Area Pollution Class	Class 4 (Very High)	OK	A	OK	A	31 mm/kV CD	C
2.4	Seismic Loads	Zone 3 UBC	OK	A	OK	A	OK	A
2.5	Relative Humidity	100%	OK	A	OK	A	OK	A
2.6	Cooling System	ONAN	OK	A	OK	A	OK	A
2.7	Primary Cooling Media	Mineral Oil	OK	A	OK	A	OK	A
3. Primary Winding Voltage Rating								
3.1	Highest System Voltage	12kV	OK	A	OK	A	OK	A
3.2	Rated Lightning Impulse Withstand Voltage	75kV	OK	A	OK	A	OK	A
3.3	Rated Short Duration Power Frequency Withstand Voltage(rms)	28kV	OK	A	OK	A	OK	A
4. Secondary Winding Voltage Ratings								
4.1	Highest System Voltage	1 kV	1.1 KV	A	1 kV	A	1 KV	A
4.2	Rated Lightning Impulse Withstand Voltage	3 kV	N.A	C	3 kV	A	N.A	C



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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
4.3	Rated Short Duration Power Frequency Withstand Voltage(rms)	1 kV	3 KV	A	1 kV	A	3 KV	A
4.4	Primary Winding	Delta Winding	OK	A	OK	A	OK	A
4.5	Secondary Winding	Star, (Solidly Grounded)	OK	A	OK	A	OK	A
4.6	Insulation Type	By Vendor	PSP & Paper	A	UNIFORM	A	UNIFORM	A
4.7	Insulation Class	Class A (Shall Be Suggested By Vendor)	Class A	A	Class A	A	Class A	A
4.8	Average Winding Temperature Rise (55°C Ambient)	65°C, Acc. to IEC 60076-2, Clause 4.2	53°C	C	65°C	C	53°C	C
4.9	Top Oil Temperature Rise (55°C ambient)	60°C, Acc. to IEC 60076-2, Clause 4.2	48°C	C	60°C	C	48°C	C
4.10	Oil Preservation System	Not Applicable (Sealed Type)	N.A	A	N.A	A	N.A	A
4.11	Short Circuit Level of HV System	Primary: 25 kA	OK for Network	A	OK	A	OK	A
4.12	Short Circuit Withstand Duration	Primary: 1 S	OK	A	OK	A	OK	A
4.13	Required Short Circuit Impedance @75°C	5%	OK	A	6%	N	OK	A
4.14	Zero Sequence Impedance	By Vendor	~5%	A	5.46	A	~4%	A
4.15	X/R Ratio at Principal Tap	By Vendor	4.13	A	5.59	A	~3.6	A
4.16	Efficiency at Full Load & PF=0.8 Lag (100% Load)	By Vendor	98.32 %	A	98.94 %	A	98.15 %	A



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نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D00	0001	TB	EL	120	PEDCO	GCS	BK

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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
4.17	Efficiency at Full Load & PF=0.8 Lag (75% Load)	By Vendor	98.66 %	A	99.15 %	A	98.51 %	A
4.18	Efficiency at Full Load & PF=0.8 Lag (50% Load)	By Vendor	98.94 %	A	99.3 %	A	98.8 %	A
5. Primary Winding Characteristics								
5.1	Reactance [Ω]	By Vendor	-	C	After Test	C	~7	C
5.2	Resistance [Ω] @ 75°C	By Vendor.	1.9048	C	After Test	C	~2	C
6. Secondary Winding Characteristics								
6.1	Reactance [Ω]	By Vendor	-	C	After Test	C	~0.002	C
6.2	Resistance [Ω] @ 75°C	By Vendor	0.00057	C	After Test	C	~0.0006	C
7. Tolerances								
7.1	Voltage Ratio at Principal Tap & No-Load	± 0.5 %	OK	A	OK	A	OK	A
7.2	Voltage Ratio at Other Tapping	± 0.5 %	OK	A	OK	A	OK	A
7.3	Voltage	± 10 %	OK	A	OK	A	OK	A
7.4	Frequency	± 5 %	OK	A	OK	A	OK	A
7.5	Short Circuit Impedance at Principal Tap	± 10 % of Declared Value	OK	A	OK	A	OK	A



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	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
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	پروژه BK	بسته کاری GCS	صادرکننده PEDCO	تسهیلات 120	رشته EL	نوع مدرک TB	سریال 0001	نسخه D00	

TBE for 1250 KVA Power Transformers								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
7.6	Short Circuit Impedance at Other Tapping	±15% of Declared Value	OK	A	OK	A	OK	A
7.7	Anticipated Unbalance Loading in Percent of Rated Power	10 %	OK	A	OK	A	OK	A
7.8	Core Construction	Laminated Silicon Steel	OK	A	OK	A	OK	A
7.9	Flux Density in the Magnetic Circuit @Nominal Frequency & Voltage	By Vendor	1.67 T	A	1.68 T	A	~1.7 T	A
7.10	No-Load Loss [W]	By Vendor	P ₀ = 2 KW	A	1.73 KW	A	1.8 KW	A
7.11	Full Load Total Loss [W]	By Vendor	P _k = 16 KW	A	14.93 KW	A	17 KW	A
7.12	Inrush Current	By Vendor	602 A	A	650 A	A	~500 A for 0.6sec	A
7.13	Short Circuit Loss	By Vendor	16 KW	A	13.2 KW	A	17 KW	A
7.14	I ² R Loss at Rated Current & Principal Tap	By Vendor	14 KW	A	11.6 KW	A	15.5 KW	A
7.15	Stray Load Loss at Rated Current & Principal Tap	By Vendor	2 KW	A	1.6 KW	A	1.5 KW	A
7.16	11 kV Cables Size & Number	1x3x95 CU/SM/XLPE/SM/SC/PVC/SWA/PVC	-	A	OK	A	OK	A
7.17	External Terminations, Primary Side (Exposed Bushings/Cable Box)	Cable Box	OK	A	OK	A	OK	A
7.18	0.42 kV Cable Size & Number	14x(1x300) CU/XLPE/Bd/AWA/PVC	-	A	OK	A	OK	A



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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
7.19	Type & Size of Cable Glands (Power Cable)	Industrial, Primary: M90 Secondary: M40	-	A	OK	A	Out of vendor scope	A
7.20	Type & Size of Cable Glands (Control Cable)	12x2.5, CU/PVC/SWA/PVC, M25	-	A	OK	A	OK	A
7.21	Bushing Type	Acc .to IPS 152	DT 20NF 250	A	DT 20NF 250	A	DT 20NF 250	A
7.22	Dimension (W X D X H) [mm]	By Vendor	2606x2153x2477	A	2120x1350x1980	C	2900x2400x2250	A
7.23	Weight [kg]	By Vendor	5413	A	4050	C	5175	A
7.24	Weight of Transformer Without Oil	By Vendor	4154	A	2710	C	4130	A
7.25	Noise Level (at 1m From Transformer) [db]	Less Than 85 dB(A)	OK	A	OK	A	OK	A
7.26	Oil Volume [liter]	By Vendor	1407	A	1450	C	1200	C
7.27	Oil Weight [kg]	By Vendor	1259	A	1380	C	1045	C
7.28	Oil Characteristics (Name/ Type/ Flash Point)	Acc. to IEC 60296	OK	A	OK	A	Mineral/140c	C
8.Auxiliary Equipment								
8.1	Top Oil Thermometer (in Thermometer Pocket)	Required (Can Be Measured at Low Oil Level)	OK	A	OK	A	OK	A
8.2	Thermostat for Oil Temperature	Dial Type / with Alarm & Trip Switches	OK	A	OK	A	OK	A
8.3	Oil Level Gauge	Magnetic Dial or Glass Type	Magnetic Dial	A	Magnetic Dial	A	OK	A



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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.4	Oil Filling Plug, Drain Valve, Isolating Valve	Required	OK	A	OK	A	OK	A
8.5	Oil Level Indicator With Contacts (Low & High)	Required (Magnetic Type)	OK	A	OK	A	OK	A
8.6	Winding Temperature Indicator with Alarm & Trip Contacts	Required (Shall be Located Close to Low Voltage Windings)	OK (LV Side Phase 2 V)	A	OK	A	OK	A
8.7	Oil Drain / Sampling Device	Required	OK	A	OK	A	OK	A
8.8	Air Dehydrating Breathed	Not Required	N.A	A	N.A	A	OK	A
8.9	Neutral Current Transformer	Core 1: 2000/1A, 5P10 ,10VA	OK	A	OK	A	OK	A
8.10	CT to be Supplied by (Transformer Manufacturer/Purchaser)	Transformer Manufacturer	OK	A	PEJVAK	A	OK	A
8.11	Earth Terminal	Two Terminals on The Bottom of Tank	OK	A	OK	A	OK	A
8.12	Upper Filter Connection With Standard Seal Valve & a Plug Serving	Required	OK	A	OK	A	OK	A
8.13	Pressure Relief Valve with Contact (Shall be Operated by Internal Pressure of Nitrogen)	Required	Pressure Relief Device with trip contact (Oil type)	C	OK	C	Pressure Relief Device with trip contact (Oil type)	C
8.14	Gas Pressure & Vacuum Indicator for Internal Pressure of Nitrogen Gas	Required	OK	A	OK	A	OK	A
8.15	Terminal Box With Gland Plate	Required	OK	A	OK	A	OK	A



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TBE for <u>1250 KVA</u> Power Transformers								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.16	Instrument and CT Secondary Terminal Box	Required (Min IP55)	IP 55	A	OK	A	OK	A
8.17	Arching Horn	Not Required	N.A	A	N.A	A	OK	A
8.18	Drain Valve	Required	OK	A	OK	A	OK	A
8.19	Lifting and Pulling Eyes	Required	OK	A	OK	A	OK	A
8.20	Lugs	Fixed to Tanks for Lifting the Complete Transformer	OK	A	OK	A	OK	A
8.21	HV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	IP 55	A	OK	A
8.22	LV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	IP 55	A	OK	A
8.23	Wheels, Bidirectional (Turnable by 90°)	Required	OK	A	OK	A	OK	A
8.24	Transformer Radiator	By Vendor (Welded/Bolted)	Bolted	A	Welded	A	Bolted	A
8.25	Transformer Cover	To be Welded to Tank With a Continuous Weld	Bolted	C	OK	A	Bolted	C
8.26	Thickness of Radiator Plate	By Vendor	1.2 mm	A	1.25 mm	A	1.2 mm	A
8.27	Thickness of Tank Wall, Base & Cover	By Vendor	8, 8, 8 mm	A	8 mm	A	6, 8, 6 mm	A
8.28	Tank Painting Specification	By Vendor	According to manufacture Painting Procedure	A	Poly Uthane	A	RAL 7032	A



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شماره پیمان:

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TBE for 1250 KVA Power Transformers

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.29	Radiator Painting Specification	By Vendor	According to manufacture Painting Procedure	A	Poly Uthane	A	RAL 7032	A
8.30	Tank and Radiator Color	By Vendor	RAL 7032	A	7032	A	RAL 7032	A
8.31	Radiator Connection	Detachable & Shall be Bolted to Tank	OK	A	OK	A	OK	A
8.32	Rating Plate	Stainless Steel	OK	A	OK	A	OK	A
8.33	Accessory Equipment Contacts Current / Voltage Rating	5A / 250VAC	OK	A	OK	A	2A / 230VAC	C
8.34	Accessory Equipment Contacts Type	Dry Type -DPDT/ 230VAC	-	C	OK	A	OK	A
8.35	Routine Tests Including	IEC60076	OK	A	OK	A	OK	A
8.36	a) Measurement of Winding Resistance	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.37	b) Measurement of Voltage Ratio & Check of Voltage Vector Relationship	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.38	c) Measurement of Impedance Voltage (Principal Tapping) Short-Circuit Impedance & Load Loss	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.39	d) Measurement of No-Load Loss & Current	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.40	e) Impedance & Load Losses at Rated Current on Principal Tap	Witness & Report	OK	A	OK	A	Acc. To contract	A



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 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	EL	TB	0001	
								D00

TBE for <u>1250 KVA</u> Power Transformers								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.41	f) Applied Potential & Induced Potential Tests	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.42	g) Dielectric tests	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.43	Type Test	Test Report on the Same Design Transformer is Required	OK	A	OK	A	Acc. To contract	A
8.44	Painting & Finish	Manufacture Standard	OK	A	OK	A	OK	A
8.45	Test Report on CTs	- turns ratio error - Excitation Characteristics - Secondary resistance - Verification of low leakage flux	-	C	OK OK OK	A		C
8.46	Special Tools if Any	By Vendor	-	A	-	A	No	A
8.47	Deviation from This Specification if Any	By Vendor	- Attached	A	NO DEVIATION	A	Red Items	A

STATUS LEGENDS:

A=Acceptable

N=Not Acceptable

N/A=Not Applicable

INA=Information Not Available

C=Clarification is Required



CA= Conditionally Acceptable

M = Requirement is Mandatory



نگهداشت و افزایش تولید میدان نفتی بینک
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 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
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	نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	
	D00	0001	TB	EL	120	PEDCO	GCS	
	BK							

TBE for <u>800</u> KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
1. Generel								
1.1	Manufacturer's Name	By Vendor	Iran Transfo	A	Kian Transfo	A	Aria Transfo	A
1.2	Transformer Tag Number	GCS-TR-003 (Fire Water Transformer)	OK	A	OK	A	OK	A
1.3	Quantity	1	OK	A	OK	A	OK	A
1.4	Standard	IPS-M-EL-152 (3) BK-GNRAL-PEDCO-000-EL-SP-0004	OK	A	OK	A	OK	A
1.5	Kind/Construction of Transformer	Oil Immersed, Hermetically Sealed With Pillow Nitrogen Separate High & Low Windings Two Winding	OK	A	OK	A	OK	A
1.6	Rated Power in Service Condition	800 kVA	OK	A	OK	A	OK	A
1.7	Supply Frequency	50 Hz \pm 5 %	OK	A	OK	A	OK	A
1.8	Winding Connection/Vector Group	Dyn11	OK	A	OK	A	OK	A
1.9	Location	Outdoor Under Shelter, Safe Area	OK	A	OK	A	OK	A
1.10	Primary Winding Rated Voltage	11kV	OK	A	OK	A	OK	A
1.11	Secondary Winding Rated Voltage	3.45 KV	OK	A	OK	A	OK	A
1.12	Tapping Range	\pm 5%, \pm 2.5% & 0 , Off Load	OK	A	OK	A	OK	A



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شماره پیمان:

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TBE FOR TRANSFORMERS

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D00	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه : 14 از 25

TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
1.13	Tapping Place	On HV Winding	OK	A	OK	A	OK	A
2. Environmental Conditions (Process Basis Of Design, BK-GNRAL-PEDCO-000-PR-DB-0001)								
2.1	Ambient Temperature Range	0 ~ 52°C	OK	A	OK	A	OK	A
2.2	Installation Elevation	12m (Above Sea Level)	1000 m	C	OK	A	OK	A
2.3	Area Pollution Class	Class 4 (Very High)	OK	A	OK	A	31mm/KV CD	C
2.4	Seismic Loads	Zone 3 UBC	OK	A	OK	A	OK	A
2.5	Relative Humidity	100%	OK	A	OK	A	OK	A
2.6	Cooling System	ONAN	OK	A	OK	A	OK	A
2.7	Primary Cooling Media	Mineral Oil	OK	A	OK	A	OK	A
3. Primary Winding Voltage Rating								
3.1	Highest System Voltage	12kV	OK	A	OK	A	OK	A
3.2	Rated Lightning Impulse Withstand Voltage	75kV	OK	A	OK	A	OK	A
3.3	Rated Short Duration Power Frequency Withstand Voltage (rms)	28kV	OK	A	OK	A	OK	A



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شماره پیمان:

053 - 073 - 9184

TBE FOR TRANSFORMERS

نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	پروژه
D00	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه : 15 از 25



TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
4. Secondary Winding Voltage Ratings								
4.1	Highest System Voltage	3.6 kV	OK	A	OK	A	OK	A
4.2	Rated Lightning Impulse Withstand Voltage	20 kV	40 KV	A	20 kV	A	OK	A
4.3	Rated Short Duration Power Frequency Withstand Voltage(rms)	10 kV	10 KV	A	OK	A	OK	A
4.4	Primary Winding	Delta Winding	OK	A	OK	A	OK	A
4.5	Secondary Winding	Star, (Neutral Grounding Resistors (NGR))	OK	C	OK	C	OK	C
4.6	Insulation Type	By Vendor	PSP & Paper	A	By Vendor	A	UNIFORM	A
4.7	Insulation Class	Class A (Shall Be Suggested By Vendor)	OK	A	OK	A	OK	A
4.8	Average Winding Temperature Rise (55°C Ambient)	65°C, Acc. to IEC 60076-2, Clause 4.2	53°C	C	65°C	C	53°C	C
4.9	Top Oil Temperature Rise (55°C ambient)	60°C, Acc. to IEC 60076-2, Clause 4.2	48°C	C	60°C	C	48°C	C
4.10	Oil Preservation System	Not Applicable (Sealed Type)	N.A	A	N.A	A	N.A	A
4.11	Short Circuit Level of HV System	Primary: 25 kA	OK for Network	A	OK	A	OK for Network	A
4.12	Short Circuit Withstand Duration	Primary: 1S	OK	A	OK	A	OK	A



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	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	EL	TB	0001	
								D00

TBE for 800 KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
4.13	Required Short Circuit Impedance @75°C	5%	OK	A	6%	N	OK	A
4.14	Zero Sequence Impedance	By Vendor	~5%	A	5.62	A	~4%	A
4.15	X/R Ratio at Principal Tap	By Vendor	3.8	A	5.72	A	~3.6	A
4.16	Efficiency at Full Load & PF=0.8 lag (100% Load)	By Vendor	98.22	A	98.83%	A	98.11%	A
4.17	Efficiency at Full Load & PF=0.8 lag (75% Load)	By Vendor	98.55	A	98.91%	A	98.46%	A
4.18	Efficiency at Full Load & PF=0.8 lag (50% Load)	By Vendor	98.9	A	98.99%	A	98.75%	A
5. Primary Winding Characteristics								
5.1	Reactance [Ω]	By Vendor	-	C	AFTER TEST	C	~12.5	C
5.2	Resistance [Ω] @ 75°C	By Vendor.	3.296	C	AFTER TEST	C	~3.4	C
6. Secondary Winding Characteristics								
6.1	Reactance [Ω]	By Vendor	-	C	AFTER TEST	C	~0.25	C
6.2	Resistance [Ω] @ 75°C	By Vendor	0.06933	C	AFTER TEST	C	~0.07	C
7. Tolerances								
7.1	Voltage Ratio at Principal Tap & No-Load	± 0.5 %	OK	A	OK	A	OK	A



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	پروژه	بسته کاری	صادر کننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	EL	TB	0001	D00	

TBE for 800 KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
7.2	Voltage Ratio at Other Tapping	±0.5 %	OK	A	OK	A	OK	A
7.3	Voltage	±10 %	OK	A	OK	A	OK	A
7.4	Frequency	±5 %	OK	A	OK	A	OK	A
7.5	Short Circuit Impedance at Principal Tap	±10% of Declared Value	OK	A	OK	A	OK	A
7.6	Short Circuit Impedance at Other Tapping	±15% of Declared Value	OK	A	OK	A	OK	A
7.7	Anticipated Unbalance Loading in Percent of Rated Power	10 %	OK	A	OK	A	OK	A
7.8	Core Construction	Laminated Silicon Steel	OK	A	OK	A	OK	A
7.9	Flux Density in the Magnetic Circuit @Nominal Frequency & Voltage	By Vendor	1.69 T	A	1.67 T	A	~1.7 T	A
7.10	No-Load Loss [W]	By Vendor	P ₀ = KW	A	1.15 kW	A	1.3 kW	A
7.11	Full Load Total Loss [W]	By Vendor	P _k = 10.5 KW	A	9.65 kW	A	11 kW	A
7.12	Inrush Current	By Vendor	377 A	A	420 A	A	~300 A for 0.6sec	A
7.13	Short Circuit Loss	By Vendor	10.5 KW	A	8.5 kW	A	11 kW	A
7.14	I ² R Loss at Rated Current & Principal Tap	By Vendor	9.9 KW	A	7.4 kW	A	10.2 kW	A
7.15	Stray Load Loss at Rated Current & Principal Tap	By Vendor	0.6 KW	A	1.1 kW	A	0.8 kW	A



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	نسخه	سریال	نوع مدرک	رشته	تسهیلات	صادرکننده	بسته کاری	
	D00	0001	TB	EL	120	PEDCO	GCS	
							BK	

TBE for <u>800</u> KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
7.16	11 kV Cables Size & Number	1x3x95 CU/SM/XLPE/SM/SC/PVC/SWA/PVC	OK	A	OK	A	OK	A
7.17	External Terminations, Primary Side (Exposed Bushings/Cable Box)	Cable Box	OK	A	OK	A	OK	A
7.18	3.45 kV Cable Size & Number	1x3x95 CU/SM/XLPE/SM/SC/PVC/SWA/PVC	OK	A	OK	A	OK	A
7.19	Type & Size of Cable Glands (Power Cable)	Industrial, Primary: M90 Secondary: M75	OK	A	OK	A	Out of vendor scope	A
7.20	Type & Size of Cable Glands (Control Cable)	12x2.5, CU/PVC/SWA/PVC, M25	OK	A	OK	A	OK	A
7.21	Bushing Type	Acc .to IPS 152	DT 20Nf 250	A	OK	A	OK	A
7.22	Dimension (W X D X H) [mm]	By Vendor	2192x1828x2055	A	2050x1150x1890	C	2300x2360x2100	A
7.23	Weight [kg]	By Vendor	3898	A	2820	C	3860	A
7.24	Weight of Transformer Without Oil	By Vendor	3098	A	1950	C	3070	A
7.25	Noise Level (at 1m from Transformer) [db]	Less Than 85 dB(A)	OK	A	OK	A	OK	A
7.26	Oil Volume [liter]	By Vendor	894	A	970	A	900	A
7.27	Oil Weight [kg]	By Vendor	800	A	870	A	790	A
7.28	Oil Characteristics (Name/ Type/ Flash Point)	Acc. to IEC 60296	OK	A	OK	A	Mineral/140c	C



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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	EL	TB	0001		D00

TBE for 800 KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.Auxiliary Equipment								
8.1	Top Oil Thermometer (in Thermometer Pocket)	Required (Can Be Measured at Low Oil Level)	OK	A	OK	A	OK	A
8.2	Thermostat for Oil Temperature	Dial Type / with Alarm & Trip Switches	OK	A	OK	A	OK	A
8.3	Oil Level Gauge	Magnetic Dial or Glass Type	Magnetic Dial	A	Magnetic Dial	A	OK	A
8.4	Oil Filling Plug, Drain Valve, Isolating Valve	Required	OK	A	OK	A	OK	A
8.5	Oil Level Indicator With Contacts (Low & High)	Required (Magnetic Type)	OK	A	OK	A	OK	A
8.6	Winding Temperature Indicator with Alarm & Trip Contacts	Required (Shall be Located Close to Low Voltage Windings)	OK (LV Side Phase 2 V)	A	OK	A	OK	A
8.7	Oil Drain / Sampling Device	Required	OK	A	OK	A	OK	A
8.8	Air Dehydrating Breathed	Not Required	N.A	A	N.A	A	OK	A
8.9	Neutral Current Transformer	Core 1: 630/1A, 5P10 ,10VA Core 2: 630/1A, Class X	OK	C	2000/1A, 5P10 ,10VA	C	OK	C
8.10	CT to be Supplied by (Transformer Manufacturer/Purchaser)	Transformer Manufacturer	OK	A	PEJVAK	A	OK	A
8.11	Earth Terminal	Two Terminals on The Bottom of Tank	OK	A	OK	A	OK	A
8.12	Upper Filter Connection With Standard Seal Valve & a Plug Serving	Required	OK	A	OK	A	OK	A



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شماره پیمان:

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D00	0001	TB	EL	120	PEDCO	GCS	BK

شماره صفحه : 20 از 25



TBE for 800 KVA Power Transformer

Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.13	Pressure Relief Valve with Contact (Shall be Operated by Internal Pressure of Nitrogen)	Required	Pressure Relief Device with trip contact (Oil type)	A	OK	A	OK	A
8.14	Gas Pressure & Vacuum Indicator for Internal Pressure of Nitrogen Gas	Required	OK	A	OK	A	OK	A
8.15	Terminal Box With Gland Plate	Required	OK	A	OK	A	OK	A
8.16	Instrument and CT Secondary Terminal Box	Required (Min IP55)	IP 55	A	OK	A	OK	A
8.17	Arching Horn	Not Required	N.A	A	OK	A	OK	A
8.18	Drain Valve	Required	OK	A	OK	A	OK	A
8.19	Lifting and Pulling Eyes	Required	OK	A	OK	A	OK	A
8.20	Lugs	Fixed to Tanks for Lifting the Complete Transformer	OK	A	OK	A	OK	A
8.21	HV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	OK	A	OK	A
8.22	MV Terminal Box with Gland Plate	Required (Min IP55)	IP 55	A	OK	A	OK	A
8.23	Wheels, Bidirectional (Turnable by 90°)	Required	OK	A	OK	A	OK	A
8.24	Transformer Radiator	By Vendor (Welded/Bolted)	Bolted	A	OK	A	Bolted	A
8.25	Transformer Cover	To be Welded to Tank With a Continuous Weld	Bolted	C	OK	A	Bolted	C



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 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	EL	TB	0001	
								D00

TBE for <u>800</u> KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.26	Thickness of Radiator Plate	By Vendor	1.2 mm	A	1.25 mm	A	1.2 mm	A
8.27	Thickness of Tank Wall, Base & Cover	By Vendor	8, 8, 8 mm	A	8 mm	A	6, 6, 6 mm	A
8.28	Tank Painting Specification	By Vendor	According to manufacture Painting Procedure	A	POLY UTHANE	A	RAL 7032	A
8.29	Radiator Painting Specification	By Vendor	According to manufacture Painting Procedure	A	POLY UTHANE	A	RAL 7032	A
8.30	Tank and Radiator Color	By Vendor	RAL 7032	A	7032	A	RAL 7032	A
8.31	Radiator Connection	Detachable & Shall be Bolted to Tank	OK	A	BOLTED	A	OK	A
8.32	Rating Plate	Stainless Steel	OK	A	OK	A	OK	A
8.33	Accessory Equipment Contacts Current / Voltage Rating	5A / 250VAC	OK	A	OK	A	2A / 230VAC	C
8.34	Accessory Equipment Contacts Type	Dry Type –DPDT/ 230VAC	-	C	-	C	OK	A
8.35	Routine Tests Including	IEC60076	OK	A	OK	A	OK	A
8.36	a) Measurement of Winding Resistance	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.37	b) Measurement of Voltage Ratio & Check of Voltage Vector Relationship	Witness & Report	OK	A	OK	A	Acc. To contract	A





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 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
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	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال		نسخه
	BK	GCS	PEDCO	120	EL	TB	0001		D00

TBE for <u>800</u> KVA Power Transformer								
Item	Description	Purchaser Requirement	Iran Transfo	Status	Kian Transfo	Status	Aria Transfo	Status
8.38	c) Measurement of Impedance Voltage (Principal Tapping) Short-Circuit Impedance & Load Loss	Witness & Report	-	C	OK	A	Acc. To contract	A
8.39	d) Measurement of No-Load Loss & Current	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.40	e) Impedance & Load Losses at Rated Current on Principal Tap	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.41	f) Applied Potential & Induced Potential Tests	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.42	g) Dielectric tests	Witness & Report	OK	A	OK	A	Acc. To contract	A
8.43	Type Test	Test Report on the Same Design Transformer is Required	OK	A	OK	A	Acc. To contract	A
8.44	Painting and Finish	MFR Standard	OK	A	OK	A	OK	A
8.45	Test Report on CTs	- turns ratio error - Excitation Characteristics - Secondary resistance - Verification of low leakage flux	-	C	OK	A		C
8.46	Special Tools if Any	By Vendor	-	A	NA	A	No	A
8.47	Deviation from This Specification if Any	By Vendor	Attached	A	NO DEVIATION	A	Red Items	A

	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>								
شماره پیمان: 053 - 073 - 9184	TBE FOR TRANSFORMERS								شماره صفحه : 23 از 25
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	نسخه	
	BK	GCS	PEDCO	120	EL	TB	0001	D00	

Status Legends:

A=Acceptable

N=Not Acceptable

N/A=Not Applicable

INA=Information Not Available



C=Clarification is Required

CA= Conditionally Acceptable

M = Requirement is Mandatory

Conclusion Table:

Item	Equipment	Vendor	Vendor	Vendor
		Iran Transfo	Kian Transfo	Aria Transfo
1	1250 KVA	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable
2	800 KVA	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
شماره پیمان: 053 - 073 - 9184	TBE FOR TRANSFORMERS							شماره صفحه : 24 از 25
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	EL	TB	0001	
								D00



Conclusion Note:

General

- 1- Item 4.5 of 800KVA transformer (secondary side) shall be changed to Earthed via NGR. Therefore second core of CT is not required & all vendors shall delete related CT it item 8.9. Data sheet shall be revised in next revision.
- 2- According to motor starting, the nominal rated voltage of 800KVA transformer shall be 11/3.45 KV. The related data sheet shall be revised.
- 3- The word “Hermitic” shall be changed to “Hermetic” in data sheet.

Iran Transfo

- 1- Item 4.2 of 1250 KVA Transformer: Vendor will not consider Lightning impulse withstand for LV Side.
- 2- According to item 7.9.1 of IPS-M-EL-152(3), Pressure relief device can be set to operate when internal pressure of nitrogen exceeds to 0.7 barg. But vendor will supply relief valve operation by oil.
- 3- According to item 7.7.3 of IPS-M-EL-152(3), the cover of the tank (item 8.25) for sealed type transformer shall be welded to the tank with a continuous weld. But vendor cannot meet this criteria & will supply bolted.

 NISOC	<p>نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض</p> <p>احداث ردیف تراکم گاز در ایستگاه جمع آوری بینک</p>							
شماره پیمان: 053 - 073 - 9184	TBE FOR TRANSFORMERS							شماره صفحه : 25 از 25
	پروژه	بسته کاری	صادرکننده	تسهیلات	رشته	نوع مدرک	سریال	
	BK	GCS	PEDCO	120	EL	TB	0001	
								D00

Kian Transfo

- 1- The Short Circuit Impedance of 1250 & 800 KVA transformer is 6% which is not acceptable.
- 2- Dimension & weight of transformer differs from 2 other vendors. While the dimension of transformer is smaller, but the required oil is more than 2 others. Items 7.22 & 7.26 shall be clarified.
- 3- No deviation list & outline drawing have been issued by vendor.

Aria Transfo

- 1- Item 4.2 of 1250 KVA Transformer: Vendor will not consider Lightning impulse withstand for LV Side.
- 2- According to item 7.9.1 of IPS-M-EL-152(3), Pressure relief device can be set to operate when internal pressure of nitrogen exceeds to 0.7 barg. But vendor will supply relief valve operation by oil.
- 3- According to item 7.7.3 of IPS-M-EL-152(3), the cover of the tank (item 8.25) for sealed type transformer shall be welded to the tank with a continuous weld. But vendor cannot meet this criteria & will supply bolted.