

**List of equipment required for replacement of the damaged equipment of NPC "Ukrenergo" as of 14.11.2022\***  
**((information for the period from 02.11.2022 to 14.11.2022 is still being updated and adjustments are possible))**

Damaged equipment	Technical parameters of the equipment	Type of equivalent equipment for replacement of the damaged one	Unit	Required quantity
Autotransformer 750 kV	333000 kVA Voltages HV/MV/LV - 750/330/15,75 kV	АОДЦТН-333000/750/330 ЗТР	phase	18
Autotransformer 330 kV	250 000 kVA Voltages HV/MV/LV - 330/150/10 kV	АТДТН-250000/330/150/10 ЗТР	pcs	1
Autotransformer 330 kV	250 000 kVA Voltages HV/MV/LV - 330/150/35 kV	АТДЦТН-250000/330/150/35 ЗТР	pcs	4
Autotransformer 330 kV	250 000 kVA Voltages HV/MV/LV - 330/220/35 kV	АТДТН-250000/330/220/35 ЗТР	pcs	1
Autotransformer 330 kV	200 000 kVA Voltages HV/MV/LV - 330/110/35 kV	АТДТН-200000/330/110 ЗТР	pcs	2
Autotransformer 330 kV	200 000 kVA Voltages HV/MV/LV - 330/110/10 kV	АТДТН-200000/330/110/10 ЗТР	pcs	1
Autotransformer 330 kV	195 000 kVA Voltages HV/MV/LV - 330/110/10 kV	АТДТН-195000/330/110 ЗТР	pcs	3
Autotransformer 330 kV	125 000 kVA Voltages HV/MV/LV - 330/110/10 kV	АТДТН-125000/330/110/10 ЗТР	pcs	2
Autotransformer 330 kV	125 000 kVA Voltages HV/MV/LV - 330/110/35 kV	АТДТН-125000/330/110/35 ЗТР	pcs	2
Autotransformer 220 kV	200 000 kVA Voltages HV/MV/LV - 220/110/10 kV	АТДТН-200000/220/110/10 ЗТР	pcs	1
Autotransformer 220 kV	125 000 kVA Voltages HV/MV/LV - 220/110/35 kV	АТДТН-125000/220/110/35 ЗТР	pcs	3
Autotransformer 220 kV	125 000 kVA Voltages HV/MV/LV - 220/110/10 kV	АТДТН-125000/220/110/10 ЗТР	pcs	1
Autotransformer 220 kV	Power - 125 000 kVA Voltages HV/MV/LV - 220/110/6 kV	АТДТН-125000/220/110/6 ЗТР	pcs.	2

Transformer 110 kV	Three-phase Power - 20000 kVA Voltages HV/MV/LV - 110/35/6 kV	ТДТН-20000/110/35/6 ЗТР	pcs.	1
Transformer 35 kV	Three-phase Power - 15000 kVA Voltages HV/LV - 35/10 kV	ТДН-15000/35/10 ЗТР	pcs	1
Transformer 35 kV	Three-phase Power - 2500 kVA Voltages HV/LV - 35/6 kV	ТМ-2500/35 ЗТР	pcs.	1
Transformer 35 kV	Three-phase Power - 630 kVA Voltages HV/LV - 35/0,4 kV	ТМ-630/35/0,4 ЗТР	pcs	1
Transformer 10 kV	Three-phase Power - 1000 kVA Voltages HV/LV - 10/0,4 kV	ТМ-1000/10 ЗТР	pcs.	2
Transformer 10 kV	Three-phase Power - 630 kVA Voltages HV/LV - 10/0,4 kV	ТМ-630/10/0,4 ЗТР	pcs	5
Transformer 6 kV	Three-phase Power - 630 kVA Voltages HV/LV - 6/0,4 kV	ТМ-630/6 ЗТР	pcs.	3

Reactor 750 kV	Single-phase Rated power - 110000 kVAp Rated voltage - 750 kV	РОМ-110000/750 ЗТР	phase	6
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Regulating transformer 35 kV	Three-phase Power - 63 000 kVA Voltages HV/LV - 38,5/38,5±10x1,5% kV	ЛТДН-63000/35 ЗТР	pcs.	3
Regulating transformer 35 kV	Three-phase Power - 40 000 kVA Voltages HV/LV - 11/11±10x1,5% kV	ЛТДН-40000/10 ЗТР	pcs.	1
Regulating transformer 35 kV	Three-phase Power - 10 000 kVA Voltages HV/LV - 38,5/38,5±10x1,5% kV	ЛТДН-100000/35 ЗТР	pcs	2

Phase Shifting Transformer 110 kV	Single-phase Rated power - 92000 kVA Voltages RW/EW/CW - 68/15,75/10,5 kV	ОДТНП-92000/110-У1 ЗТР	phase	6
Phase Shifting Transformer 150 kV	Single-phase Rated power - 92000 kVA Voltages RW/EW/CW - 68/15,75/10,5 kV	ОДТНП-92000/150-У1 ЗТР	phase	2

Circuit breaker 750 kV	Rated voltage - 750 kV Rated current - 4000A Rated short-circuit breaking current - 40 kA	LTB 800E4 HITACHI-ABB	set 3 phases	4
Circuit breaker 330 kV	Rated voltage - 330 kV Rated current - 3150A Rated short-circuit breaking current - 40 kA	3AP2FI Siemens GL 315 Alstom GE GL 316 Alstom GE HPL 420B2 HITACHI-ABB LTB 420E2 HITACHI-ABB	set 3 phases	20
Circuit breaker 220 kV	Rated voltage - 220 kV Rated current - 3150A Rated short-circuit breaking current - 40 kA	LTB 245-220-40/3150 HITACHI-ABB	set 3 phases	11
Circuit breaker 150 kV	Rated voltage - 150 kV Rated current - 3150A Rated short-circuit breaking current - 40 kA	LTB-170 D1/B HITACHI-ABB	set 3 phases	9
Circuit breaker 110 kV	Rated voltage - 110 kV Rated current - 3150A Rated short-circuit breaking current - 40 kA	LTB 145-110-40/3150 HITACHI-ABB	set 3 phases	25
Circuit breaker 35 kV	Rated voltage - 35 kV Rated current - 2000A Rated short-circuit breaking current - 40 kA	OHB 40.25.32 HITACHI-ABB	pcs	4

Disconnecter 750 kV with one earthing switch	Rated voltage - 750 kV Rated current - 3150A	Z BF12-800+1AE R RUHRTAL	set 3 phases	2
Disconnecter 330 kV with two earthing switches	Rated voltage - 330 kV Rated current - 3150A	GW-57-363DII HITACHI-ABB S2DA2T-362 Alstom GE SPOLT2-362 Alstom GE	set 3 phases	18
Disconnecter 330 kV with one earthing switch	Rated voltage - 330 kV Rated current - 3150A	GW-57-363DI HITACHI-ABB S2DAT-362 Alstom GE SPOLT-362 Alstom GE	set 3 phases	18
Disconnecter 220 kV with two earthing switches	Rated voltage - 220 kV Rated current - 2000A	S2DA2T-245 Alstom GE ONI-245 Siemens	set 3 phases	5
Disconnecter 220 kV with one earthing switch	Rated voltage - 220 kV Rated current - 2000A	S2DAT GE (ALSTOM)	set 3 phases	13
Disconnecter 150 kV with two earthing switches	Rated voltage - 150 kV Rated current - 2000A	S2DA2T-170 Alstom GE GW55-170DII HITACHI-ABB	set 3 phases	5
Disconnecter 150 kV with one earthing switch	Rated voltage - 150 kV Rated current - 2000A	S2DAT-170 Alstom GE GW55-170DI HITACHI-ABB	set 3 phases	20
Disconnecter 110 kV with two earthing switches	Rated voltage - 110 kV Rated current - 2000A	GW55 -126DII HITACHI-ABB S2DA2T-126 Alstom GE	set 3 phases	8
Disconnecter 110 kV with one earthing switch	Rated voltage - 110 kV Rated current - 2000A	GW55 -126DI HITACHI-ABB S2DAT-126 Alstom GE	set 3 phases	46
Disconnecter 35 kV with two earthing switches	Rated voltage - 35 kV Rated current - 2000A	GW55 -72,5DII HITACHI-ABB S2DA2T-72,5 Alstom GE	set 3 phases	3
Disconnecter 35 kV with one earthing switch	Rated voltage - 35 kV Rated current - 2000A	GW55 -72,5DI HITACHI-ABB S2DAT-72,5 Alstom GE	set 3 phases	9

Current transformer 750 kV	SF6-filled Rated voltage - 750 kV Transformer ratio - 4000-3000-2000-1500/1 Accuracy class - 0,2S/0,2S/10P/10P/10P/10P	SAS-765, Trench Siemens SAS-800, Trench Siemens TG-800, HITACHI-ABB	phase	5
Current transformer 330 kV	SF6-filled Rated voltage - 330 kV Transformer ratio - 2000/1 Accuracy class - 0,2S/0,2S/10P/10P/10P/10P	SAS-363 Siemens	phase	27
Current transformer 330 kV	SF6-filled Rated voltage - 330 kV Transformer ratio - 2000/5 Accuracy class - 0,2S/0,2S/10P/10P/10P/10P	TG-245 HITACHI-ABB	phase	9
Current transformer 220 kV	SF6-filled Rated voltage - 220 kV Transformer ratio - 1200/1 Accuracy class - 0,5/10P/10P/10P	TG-245 HITACHI-ABB	phase	3

Current transformer 220 kV	SF6-filled Rated voltage - 220 kV Transformer ratio - 600/5 Accuracy class - 0,5/10P/10P/10P	TG-245 HITACHI-ABB	phase	6
Current transformer 220 kV	SF6-filled Rated voltage - 220 kV Transformer ratio - 600-1200/5 Accuracy class - 0,5/10P/10P/10P	TG 170 HITACHI-ABB	phase	6
Current transformer 150 kV	SF6-filled Rated voltage - 150 kV Transformer ratio - 1200/5 Accuracy class - 0,5/10P/10P/10P	TG-145 HITACHI-ABB	phase	27
Current transformer 110 kV	SF6-filled Rated voltage - 110 kV Transformer ratio - 750-1500/1 Accuracy class - 0,5/10P/10P/10P	TG-145 HITACHI-ABB	phase	21
Current transformer 110 kV	SF6-filled Rated voltage - 110 kV Transformer ratio - 1500/5 Accuracy class - 0,5/10P/10P/10P	TG-145 HITACHI-ABB	phase	9
Current transformer 110 kV	SF6-filled Rated voltage - 110 kV Transformer ratio - 600-1000/5 Accuracy class - 0,5/10P/10P/10P	TG-145 HITACHI-ABB	phase	9

Voltage transformer 110 kV	SF6-filled Rated voltage - 110 kV	SVS 145 Trench (Siemens)	phase	9
Voltage transformer 220 kV	SF6-filled Rated voltage - 220 kV	SVS 245 Trench (Siemens)	phase	15
Voltage transformer 330 kV	"SF6-filled Rated voltage - 330 kV"	SVS 362 Trench (Siemens) TVI 362 TIP 362 HITACHI-ABB TEIMF 362 Trench Siemens	phase	9

Surge Arrester 750 kV	Rated voltage Surge Arrester (Ur) - 612 kV Line discharge class - 3	3EP3 612-5PK54-2NE1 Siemens	set 3 phases	4
Surge Arrester 330 kV	Rated voltage Surge Arrester (Ur) - 288 kV Line discharge class - 2	3EL2-288-3PM42-4NA Siemens	set 3 phases	14
Surge Arrester 220 kV	Rated voltage Surge Arrester (Ur) - 192 kV Line discharge class - 2	3EL2 192-2PQ32-4XE1 Siemens	set 3 phases	5
Surge Arrester 150 kV	Rated voltage Surge Arrester (Ur) - 138 kV Line discharge class - 3	3EL3 138-2PM31-4NE1 Siemens	set 3 phases	7
Surge Arrester 110 kV	Rated voltage Surge Arrester (Ur) - 108 kV Line discharge class - 2	3EL2 108-2PJ31-4TA1-Z Siemens	set 3 phases	6
Surge Arrester 35 kV	Rated voltage Surge Arrester (Ur) - 37,5 kV Line discharge class - 2	MWK 41 HITACHI-ABB	set 3 phases	4
Surge Arrester 6 kV	Rated voltage Surge Arrester (Ur) - 6,3 kV Line discharge class - 2	MWK 7 HITACHI-ABB	set 3 phases	2

Battery	Battery voltage - 230 B Elements voltage - 2 B Capacity - 450 Ah Service life - not less than 20 years	18 GroE 450 12 GroE 300 Exide Classic	set	2
Battery	Battery voltage - 230 B Elements voltage - 2 B Capacity - 500 Ah Service life - not less than 20 years	5 GroE 500 Exide Classic	set	4
Battery	Battery voltage - 230 B Elements voltage - 2 B Capacity - 375 Ah Service life - not less than 20 years	15 GroE 375 Exide Classic	set	1

	Control automatics for circuit breaker 330-750 kV	REC670 (7VK87)	terminal	35
	Control automatics for circuit breaker 110-220 kV	REC650 (7VK87)	terminal	18

Relay protection and emergency automatics	Distance and overcurrent protections for OHL 330-750 kV	REL670 (7SA87)	terminal	20
	Distance and overcurrent protections for OHL 110-220 kV	REL650 (7SA86)	terminal	14
	Phase-comparison protection for OHL 330-750 kV	L60	terminal	20
	Phase-comparison protection for OHL 330-750 kV	DFZ Diamant	terminal	5
	Line differential protection	RED670 (7SL87)	terminal	1
	Differential protection for AT 330-750 kV	RET670 (7UT87)	terminal	11
	Autotransformer Bushings insulation control	7SJ804	terminal	2
	Differential busbar protection 110-750 kV	REB670 (7SS85)	terminal	16
	Line open-phase detection device, overvoltage protection automatics	REC670	terminal	8
	Automatic of elimination of asynchronous mode	REL670	terminal	3
	Special automatic load shedding		terminal	1
	Device for receiving-transmitting commands	APK "Orion"	terminal	32
	High-frequency post	UPZ «Orion»	terminal	7