

The Urgent need is to strengthen the protection of energy objects by Air Defense Systems

General comments after massive attacks in March-April 2024:

After receiving the full information the list of damaged equipment will be updated.

Urgency of first priority is highlighted in green.



UB
Міністерство енергетики України
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List of equipment damaged during air strikes and needed to be replaced by TPP

№	Item name	Quantity	Estimated Cost/Unit (Euros, excl. VAT)*	Estimated total value (Euros, excl. VAT)*	№
1	Generator ТГБ-200	2	1 Urgent	10 000 000	20 000 000
2	Autotransformer АТДЦТН-200000/330/110-74У	2	1 Urgent	1 568 750	3 137 500
3	Transformer oil Shell Diala S4 ZX-1	200 ton	1 Urgent	2 508	501 600
4	Voltage transformer ЗНОМ-35-65У1	3	1 Urgent	9 690	29 070
5	35 kV surge arrester PEXLIM R 48-YV 036 , pcs	3	1 Urgent	348	1 044
6	35 kV disconnect switch РНДЗ.2-35/1000 , 3-phase set	1	1 Urgent	8 000	8 000
7	330 kV surge arrester PEXLIM P 276-XH 362, 3-phase set	1	1 Urgent	7 650	7 650
8	Generator ТГБ-200	2	2 By 01.04.2025	10 000 000	20 000 000
9	Generator ТГБ-200М	1	2 By 01.04.2025	10 000 000	10 000 000
10	330 kV autotransformer АТДЦТН-125000/330/110-77У1	1	2 By 01.04.2025	1 568 750	1 568 750
11	110 kV transformer bushing	3	2 By 01.04.2025	25 446	76 338
12	Overhead crane	2	2 By 01.04.2025	1 040 668	2 081 336
13	Electric motor 1500 rpm, 200 kW	2	3 By 01.09.2025	7 650	15 300
14	Electric motor 1500 rpm, 100 kW	2	3 By 01.09.2025	7 650	15 300
15	Electric motor 1500 rpm, 21 kW	2	3 By 01.09.2025	763	1 526
16	Electric motor 1500 rpm, 11 kW	3	3 By 01.09.2025	479	1 437
17	Electric motor 750 rpm, 28 kW	2	3 By 01.09.2025	1 822	3 644
18	Electric motor 2985 rpm, 4000 kW	1	3 By 01.09.2025	417 500	417 500
19	Electric motor 2985 rpm, 3800 kW	2	3 By 01.09.2025	417 500	835 000
20	Electric motor 1500 rpm, 18.51 kW	6	3 By 01.09.2025	763	4 578
21	Electric motor 1500 rpm, 20 kW	2	3 By 01.09.2025	763	1 526
22	Electric motor 375 rpm, 1700 kW	1	3 By 01.09.2025	417 500	417 500

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23	Generator ТГВ-300, pcs	3	12 000 000	36 000 000
24	Block transformer ТДЦ-400000/330, pcs	2	5 647 500	11 295 000
25	Transformer for own needs ТРДНС-32000/35, pcs	1	492 400	492 400
26	Transformer oil, tons	200	2 508	501 600
27	Oil ТР-22s, tons	300	2 100	630 000
28	Feeding electric pump unit ПЕ 600-300, pcs	2	721 000	1 442 000
29	Turbocharger electric pump unit ОСПТ-1150, pcs	2	721 000	1 442 000
30	Turbine oil pump, pcs	4	14 000	56 000
31	Emergency turbine oil pump, pcs.	4	900	3 600
32	Increased turbine oil pump, pcs.	4	763	3 052
33	Emergency oil pump, reinforced turbine, pcs.	2	763	1 526
34	Gas cooling pump, pcs.	4	14 000	56 000
35	Brush ring apparatus, pcs.	3	72 240	216 720
36	Turbine section covering, m2	21600	17	367 200
37	glazing with corrugated board permanent, temporary ends rows А, Б, В, Г m2	5300	9	47 700

Preliminary list of the equipment needed for HPP restoration

No.	Infrastructure	Equipment	Unit	Quantity	Lost/installed capacity	*Priority of restoration	**Proposals on further actions	Possibility of equipment commissioning by Autumn-Winter period of 2024-2025 (+/-)	Possibility of equipment commissioning by Autumn-Winter period of 2025-2026 (+/-)	Deadline for supply of equipment to ensure performance of the assignments (columns 9,10)	Comments (possible manufacturer)
1	2	3	4	5	6	7	8	9	10	11	12
1	Generation	Compressor Alup 341 No. 2, No. 3	pcs.	2	-	2	Repair + new elements	+			Compressors International
2	Generation	Hydro unit No. 5 (oil head, upper bracket, stator, rotor, winding)	pcs.	1	50 MW	1	Inspection, diagnostics and overhaul	+			UEM
3	Generation	Hydro generator No.5 excitation system	pcs.	1	50 MW	1	New	+			ABB, ALSTOM
4	Generation	Hydro generator No.6 excitation system	pcs.	1	50 MW	1	New	+			ABB, ALSTOM
5	Generation	Electrical protection for hydro units Nos. 5, 6 and the block, current transformers, voltage transformers				1	New	+			
6	Generation	Block No.3 control system (HU Nos. 5, 6)	pcs.	1	100 MW	1	Inspection, diagnostics and overhaul	+			Emerson, Enpaselectro
7	Generation	Block No. 3 oil pressure device (HU Nos. 5, 6)	pcs.	1	100 MW	1	Inspection, diagnostics, partial replacement	+			
8	Generation	"Ovation" control system				1	Diagnostics, overhaul, partial replacement	+			Emerson, Enpaselectro
9	Generation	Electrical measurement system of hydro units No. 5, No. 6 PECA 300	pcs.	2		1	New	+			Enpaselectro

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1	2	3	4	5	6	7	8	9	10	11	12
10	Generation	Power transformer ТРД-90000/110 Block No.5	pcs.	1	55,5/66 MW	1	Testing/Repair		+		ATEF
11	Generation	SF6 block circuit-breaker BT-5 GL-312F1	pcs.	1		1	New	+			ABB, ALSTOM
12	Generation	Transformer disconnecter T-5 three-phase 600A S2DAT	pcs.	1		1	New	+			ABB
13	Generation	II bus section ТП-110 kV (busbar)	km	2		1	New	+			
14	Generation	Overhead span ГЕC-BPY-110 kV (Bushing-2)	km	3		1	Testing/Repair	+			
15	Generation	Support structure of II bus section ТП-110 kV	pcs.	1		1	New	+			
16	Generation	Single-phase current transformer IMB 123 Block No.5	pcs.	3		1	New	+			ABB
17	Generation	Single-phase current transformer IMB 123 Block No.4	pcs.	1		1	New	+			ABB
18	Generation	Power transformer ТРД-90000/110 Block No.4	pcs.	1	74/88 MW	1	Testing/Repair	+			ATEF
19	Generation	Г-17 – Г-21 generators excitation system power cabinet	Set	5		1	Inspection/Testing		+		ABB, ALSTOM
20	Generation	Excitation transformers of Resibloc TB-16 – TB-21 type	pcs.	6		1	Inspection/Testing	+			ABB, ALSTOM
21	Generation	Auxiliary transformer 10/0,4 kV 630 kVA T-15-3, Board 15CO	pcs.	1		2	Restoration		+		
22	Generation	Power transformer ТРД-90000/110 Block No.6	pcs.	1	44/88 MW	1	Inspection/Testing	+			ZTZ
23	Generation	Earthing disconnecter 3OH-110M-II УХЛ1 Block No. 5	pcs.	3		1	New	+			ABB
24	Generation	Cells КPY-6,3 kV Block No.5 (8 cells)	Set	1		1	Inspection/ Testing/Repair		+		Amper
25	Generation	BF-14, BF-16 – BF-23 generator circuit breakers cells	pcs.	9		1	Inspection/ Testing/Repair	+			
26	Generation	Block No.4 4TH-2	pcs.	1		1	Inspection/ Testing/Repair	+			ABB, ALSTOM
27	Generation	Block No.4/ 3PY-6,3kV signalization, control cabinets of Г-13 (CAB213)	pcs.	4		1	Inspection/ Testing/Repair	+			Emerson
28	Generation	Block No.5/3PY-6,3kV/Excitation cabinets, excitation transformers Г-17- Г-20	Set	4		1	Testing/Repair		+		ABB, ALSTOM
29	Generation	Block No.4,6/3PY-6,3kV/Excitation AVR cabinets Г-13-16, 21-24	Set	8		1	Testing/Repair/ Replacement	+			ABB, ALSTOM

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1	2	3	4	5	6	7	8	9	10	11	12
30	Generation	Block No.5/3PY-6,3kV/Excitation AVR cabinets Г-17-20(+ T3 temperature control cabinet)	Set	4			Testing/Repair/ Replacement		+		ABB
31	Generation	Block No.4/KPY-6,3kV/4TH-2	pcs.	1			New	+			ABM Amper
32	Generation	Block No.4/3PY-6,3kV/ Hydromechanical protections, control, signalization Г-13-16	pcs.	4			Testing/Repair/ Replacement	+			Emerson
33	Generation	Block No.5/3PY-6,3kV/ Hydromechanical protections, control, signalization Г-17-20	pcs.	12			New		+		Emerson
34	Generation	Block No.5/3PY-6,3kV/ SCADA block control system	pcs.	2			New		+		Emerson
35	Generation	Block No.5/ KPY-6,3kV/BK-18, BK-19, 5TH-3	шт	3			Testing/Repair/ Replacement		+		ABM Amper
36	Generation	Block No.5/3PY-6,3kV/ Electrical protection Г-17-20	Set	3			Testing/Repair/ Replacement		+		Enpaselectro, ABB
37	Generation	Block No.5/3PY-6,3kV/ Electrical protection Б5	Set	1			Testing/Repair/ Replacement		+		Enpaselectro
38	Generation	Block No.5-6/ ТП-110kV, 3PY-6,3kV / Cable connections	Set	2			New	+			KECC
39	Generation	Power transformer ГТ11-12	pcs.	1	280 MVA	1	inspection and repair	+			ZTZ
40	Generation	Power transformer ГТ13-14	pcs.	1	280 MVA	2	inspection and overhaul	+			ZTZ
41	Generation	Power transformer ГТ15-16	pcs.	1	280 MVA	2	new		+		ZTZ
42	Generation	Power transformer ГТ17-18	pcs.	1	280 MVA	3	inspection and overhaul		+		ZTZ
43	Generation	Power transformer T3	pcs.	1	6300 kVA	1	inspection - repair or new	+			ZTZ
44	Generation	Power transformer T4	pcs.	1	6300 kVA	2	inspection and overhaul		+		ZTZ
45	Generation	Circuit-breaker EB ГТ 11-12	pcs.	1		1	restoration		+		ABB, ALSTOM
46	Generation	Circuit-breaker EB ГТ 13-14	pcs.	1		2	new		+		ABB, ALSTOM
47	Generation	Circuit-breaker EB ГТ 15-16	pcs.	1		2	new		+		ABB, ALSTOM
48	Generation	Circuit-breaker EB ГТ 17-18	pcs.	1		3	new		+		ABB, ALSTOM
49	Generation	Surge arrester ГТ 11-12	pcs.	1		1	restoration	+			ABB, ALSTOM
50	Generation	Surge arrester ГТ 13-14	pcs.	1		2	new		+		ABB, ALSTOM

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1	2	3	4	5	6	7	8	9	10	11	12
51	Generation	Surge arrester ГТ 15-16	pcs.	1		2	new		+		ABB, ALSTOM
52	Generation	Surge arrester ГТ 17-18	pcs.	1		3	new		+		ABB, ALSTOM
53	Generation	Surge arrester Л 1	pcs.	1		1	restoration	+			ABB, ALSTOM
54	Generation	Surge arrester Л-2	pcs.	1		2	new		+		ABB, ALSTOM
55	Generation	Disconnecter Л1-01	pcs.	1		1	restoration	+			ABB, ALSTOM
56	Generation	Disconnecter Л1-02	pcs.	1		2	new		+		ABB, ALSTOM
57	Generation	Disconnecter Л2-01	pcs.	1		2	new		+		ABB, ALSTOM
58	Generation	Disconnecter Л2-02	pcs.	1		3	new		+		ABB, ALSTOM
59	Generation	Voltage transformer ТН Л1	pcs.	1		1	restoration	+			ABB
60	Generation	Voltage transformer ТН Л2	pcs.	1		2	new		+		ABB
61	Generation	Current transformer ГТ11-12	pcs.	1		1	restoration	+			ABB
62	Generation	Current transformer ГТ13-14	pcs.	1		2	new		+		ABB
63	Generation	Current transformer ГТ15-16	pcs.	1		2	new		+		ABB
64	Generation	Current transformer ГТ17-18	pcs.	1		3	new		+		ABB
65	Generation	ОРУ-150 kV. Л1 line cell	pcs.	1		1	Busbar, support - repair + new	+			
66	Generation	ОРУ-150 kV. Л2 line cell	pcs.	1		2	Busbar, support - repair + new		+		
67	Generation	Gantry crane Service bridge НБ ДГЭС-2	pcs.	1		1	repair	+			
68	Generation	Service bridge crane runways	pcs.	1		1	repair	+			
69	Generation	Tailrace gate set No.1	pcs.	1		2	repair		+		Ukrsteelconstruction
70	Generation	Tailrace gate set No.2	pcs.	1		2	repair		+		Ukrsteelconstruction
71	Generation	Tailrace gate set No.3	pcs.	1		2	repair		+		Ukrsteelconstruction
72	Generation	Tailrace gate set No.4	pcs.	1		2	repair		+		Ukrsteelconstruction
73	Generation	Tailrace gate set No.5	pcs.	1		2	repair		+		Ukrsteelconstruction
74	Generation	Semigantry unit crane ЛБ No.2	pcs.	1		1	repair	+			Ukrsteelconstruction
75	Generation	Semigantry unit crane ЛБ №1	pcs.	1		1	repair	+			Ukrsteelconstruction
76	Generation	Unit cranes runways	pcs.	1		1	repair	+			
77	Generation	Unit cranes power trolleys	pcs.	1		1	repair + new elements	+			
78	Generation	Lifting beam for handling a rotor	pcs.	1		2	new		+		Ukrsteelconstruction
79	Generation	Hydraulic turbine with equipment set, № 11	pcs.	1	122 MW	1	diagnostics + repair	+			UEM
80	Generation	Hydraulic turbine with equipment set, № 12	pcs.	1	107 MW	1	diagnostics + repair	+			UEM
81	Generation	Hydraulic turbine with equipment set, № 13	pcs.	1	122 MW	2	diagnostics	+			UEM
82	Generation	Hydraulic turbine with equipment set, № 14	pcs.	1	has been under reconstruction	2	diagnostics		+		UEM
83	Generation	Hydraulic turbine with equipment set, № 15	pcs.	1	122 MW	2	diagnostics		+		UEM
84	Generation	Hydraulic turbine with equipment set, № 16	pcs.	1	122 MW	2	diagnostics		+		UEM
85	Generation	Hydraulic turbine with equipment set, № 17	pcs.	1	122 MW	3	diagnostics		+		UEM
86	Generation	Hydraulic turbine with equipment set, № 18	pcs.	1	122 MW	3	diagnostics		+		UEM
87	Generation	Hydro generator with equipment set (protection, excitation system), No. 11	pcs.	1	140 MVA	1	diagnostics	+			UEM

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1	2	3	4	5	6	7	8	9	10	11	12
50	Generation	Hydro generator with equipment set (protection, excitation system), No. 12	pcs.	1	130,6 MVA	1	diagnostics	+			UEM
51	Generation	Hydro generator with equipment set (protection, excitation system), No. 13	pcs.	1	140 MVA	2	diagnostics	+			UEM
52	Generation	Hydro generator with equipment set (protection, excitation system), No. 14	pcs.	1	has been under reconstruction	2	new		+		UEM
53	Generation	Hydro generator with equipment set (protection, excitation system), No. 15	pcs.	1	140 MVA	2	diagnostics - repair/new		+		UEM
54	Generation	Hydro generator with equipment set (protection, excitation system), No. 16	pcs.	1	140 MVA	2	diagnostics - repair/new		+		UEM
55	Generation	Hydro generator with equipment set (protection, excitation system), No. 17	pcs.	1	140 MVA	3	new		+		UEM
56	Generation	Hydro generator with equipment set (protection, excitation system), No. 18	pcs.	1	140 MVA	3	new		+		UEM
57	Generation	DC panel BY1, BY2, BY3	pcs.	1		1	new	+			Elektrotechnik Corporation
58	Generation	Speed governor of HU 11	pcs.	1		1	diagnostics, repair	+			ALSTOM
59	Generation	Speed governor of HU 12	pcs.	1		1	diagnostics, repair	+			ALSTOM
60	Generation	Speed governor of HU 13	pcs.	1		1	diagnostics, repair or new	+			ALSTOM
61	Generation	Speed governor of HU 14	pcs.	1		2	new		+		ALSTOM
62	Generation	Speed governor of HU 15	pcs.	1		2	new		+		ALSTOM
63	Generation	Speed governor of HU 16	pcs.	1			diagnostics, repair or new		+		ALSTOM
64	Generation	Speed governor of HU 17	pcs.	1			new		+		ALSTOM
65	Generation	Speed governor of HU 18	pcs.	1			new		+		ALSTOM
66	Generation	Station-wide, control and protection device	pcs.	1		1	diagnostics, repair or new	+			Emerson
67	Generation	control and protection device Л1	pcs.	1		1	diagnostics, repair or new	+			Emerson
68	Generation	control and protection device Л2	pcs.	1		2	new		+		Emerson
69	Generation	Commercial accounting of HPP-2	pcs.	1		1	repair + new elements	+			Emerson
70	Generation	6 kV engineering grid service station	pcs.	1		2	new		+		Emerson
71	Generation	station level controller	pcs.	1		1	repair with replacement of elements	+			Emerson
72	Generation	RECON recorder Л1	pcs.	1		1	new	+			Emerson
73	Generation	RECON recorder Л2	pcs.	1		2	new		+		Emerson
74	Generation	System for managing and monitoring station-wide needs	pcs.	1		1	repair with replacement of elements	+			Emerson
75	Generation	IT 11-12 block monitoring and control system	pcs.	1		1	repair with replacement of elements	+			Emerson
76	Generation	IT 13-14 block monitoring and control system	pcs.	1		2	new		+		Emerson
77	Generation	IT 15-16 block monitoring and control system	pcs.	1		2	new		+		Emerson
78	Generation	IT 17-18 block monitoring and control system	pcs.	1		3	new		+		UEM

List of equipment damaged during air strikes and needed to be replaced by TSO

No	Territorial Network Maintenance Administration (TNMA)	Connection	Damaged equipment	Technical specifications of the equipment	Type of equivalent equipment to replace the damaged one	A unit of of measurement	The required quantity
1	Eastern	CT SV 1-3	Current transformer 330kV	Gas-insulated Rated voltage - 330 kV Transformation ratio - 2000/1 Accuracy class - 0.2S/0.2S/10P/10P/10P/10P	SAS-362 Siemens	3 phase set	1
2		3AT	Autotransformer 330 kV	Three-phase Power - 200 MVA LV/CH/IL voltages - 330/110/35 kV	ATDTN - 200000/330/110/35 ZTR	pcs	1
3		CT 3AT	Current transformer 330kV	Rated voltage - 330 kV Transformation ratio - 2000/1 Accuracy class - 0.2S/0.2S/10P/10P/10P/10P	SAS-363 Siemens	3 phase set	1
4		CT 3SCH330	Voltage transformer 330kV	Rated voltage - 330 kV	SVS 362 Trench (Siemens)	phase	3
5		CT 1SH330	Voltage transformer 330kV	Rated voltage - 330 kV	SVS 362 Trench (Siemens)	phase	3
6		CT 1AT	Current transformer 330kV	Rated voltage - 330 kV Transformation ratio - 2000/1 Accuracy class - 0.2S/0.2S/10P/10P/10P/10P	SAS-362 Siemens	3 phase set	1
7		CT 3SSH110	Voltage transformer 110kV	Rated voltage - 110 kV	SVS 123 Trench (Siemens)	phase	3
8		MV-110 Skhidna-Pivdenkabel	Circuit breaker 110 kV	Rated voltage - 110 kV Rated current - 2000A Current off. Short-circuit current - 50 kA	Siemens 3AP1FG145	3 phase set	1
9			Current transformer 110kV	Rated voltage - 110 kV Transformation ratio - 1000-2000/5 Accuracy class - 0.2S/0.2S/10P/10P/10P/10P	SAS-123 Siemens	3 phase set	1
10		MV-110 TEC-3 NO. 1	Circuit breaker 110 kV	Rated voltage - 110 kV Rated current - 2000A Current off. Short-circuit current - 50 kA	Siemens 3AP1FG145	3 phase set	1
11			Current transformer 110kV	Rated voltage - 110 kV Transformation ratio - 1000-2000/5 Accuracy class - 0.2S/0.2S/10P/10P/10P/10P	SAS-123 Siemens	3 phase set	1
12		MV-110 SV 1-2	Circuit breaker 110 kV	Rated voltage - 110 kV Rated current - 2000A Current off. Short-circuit current - 50 kA	Siemens 3AP1FG145	3 phase set	1
13			Current transformer 110kV	Rated voltage - 110 kV Transformation ratio - 1000-2000/5 Accuracy class - 0.2S/0.2S/10P/10P/10P/10P	SAS-123 Siemens	3 phase set	1
14		3SZh110 arresters	Discharge arrester 110 kV	Rated voltage - 110 kV	3EL2 108-2PJ31-4TA1-Z Siemens	3 phase set	1
15		330kV 3AT arresters	Discharge arrester 330 kV	Rated voltage - 330 kV	3EL2-288-3PM42-4NA Siemens	3 phase set	1

16	Eastern	2AT	Autotransformer 330 kV	Three-phase Power - 200 MVA HV/LV/LI voltages - 330/110/6 kV	ATDTN -200000/330/110/6 ZTR	pcs	1
17		3AT	Autotransformer 330 kV	Three-phase Power - 200 MVA HV/LV/LI voltages - 330/110/6 kV	ATDTN -200000/330/110/6 ZTR	pcs	1
18		Booster 2 BT	Regulation transformer 6 kV	Type - LTDN - 40000 \6 Rated voltage - 6 kV Rated power - 40 MVA	LTDN - 40000 \6 ZTR	pcs	1
19		SA-330 3AT	Surge arrester 330kV	3EL-288-3PM42-4NA Rated voltage - 330 kV	3EL-288-3PM42-4NA	3 phase set	1
20		CT-110 kV 1SCH	Voltage transformer 110 kV	NKF-110 U1	SVS-123	3 phase set	
21			Circuit breaker 110kV	U-110-2000-50-Y1	Siemens 3AP1FG145, 50kA	3 phase set	1
22		34 SC	Current transformer 110kV	Rated voltage - 110 kV Transformation ratio - 1000-2000/5 Accuracy class - 0.2S/0.2S/10P/10P/10P/10P	SAS-123 Siemens	3 phase set	1
23		1AT	Autotransformer 330 kV	Three-phase Power - 200 MVA HV/LV/LI voltages - 330/110/6 kV	АТДТН-200000/330/110/6 3ТР	pcs	1

24	Eastern	PV L-CENTER-1	Circuit breaker 150 kV	Rated voltage - 150 kV Rated current - 3150A Current off. Short-circuit current - 40 kA	LTB-170 D1/B HITACHI-ABB	3 phase set	1
25		PV L-COF-2	Circuit breaker 150 kV	Rated voltage - 150 kV Rated current - 3150A Current off. Short-circuit current - 40 kA	LTB-170 D1/B HITACHI-ABB	3 phase set	1
26		PV L-Pris-2	Circuit breaker 150 kV	Rated voltage - 150 kV Rated current - 3150A Current off. Short-circuit current - 40 kA	LTB-170 D1/B HITACHI-ABB	3 phase set	1
27		TS PV L-PRCH-2 f.A	Current transformer 150 kV	Gas-insulated Rated voltage - 150 kV Transformation ratio - 1200/5 Accuracy class - 0.2S/10P/10P/10P	TG 170 HITACHI-ABB	phase	3
28		RV TN-1 f.B	Discharge arrester 150kV	Rated voltage - 150 kV	3EL3 138-2PM31-4NE1 Siemens	phase	3
29		L-COF-2-1 f.A	Disconnecter 150 kV, with one earthing switch	Rated voltage - 150 kV Rated current - 2000A	S2DAT GE (ALSTOM)	3 phase set	1
30		TN-1A	Voltage transformer 150kV	Rated voltage - 150 kV	SVS 170 Trench (Siemens)	phase	3

31	Western	AT-2, phase B	Autotransformer 750 kV	Single-phase Rated capacity - 333000 kVA HV/MV/LV voltages - 750/330/15.75 kV	AODTsTN333000/750/330 ZTR	phase	1
32		AT-1	Bushing 330 kV	1) GMTP-45-330/1000-u1 (AT-1 f. A) IEEE.686.343.008 2) GMTPA-45-330/1000-U1 (AT-1 f. B) 2Shchts.800.093.01 3) GKTII-45-330/1000-O1 (AT-1 f. C) IEEE.686353.001	ETFt-1175-363-B E9 (art. no. 327921)	pcs	3
33		SA-110 AT-1	Surge arrester 110 kV	Rated voltage of the arrester (Ur) - 108 kV Line discharge class - 2	3EL2 108-2PJ31-4TA1-Z Siemens	3 phase set	1
34		AT-1	Autotransformer 330 kV	Three-phase Capacity - 125 000 kVA HV/MV/LV voltages - 330/110/10 kV	ATDTN -125000/330/110/10 ZTR	pcs	1
35		VDT-1	Regulating transformer 35 kV	Three-phase Power - 40 000 kVA HV/LV voltages - 11/11±10x1.5% kV	LTDN-40000/10 ZTR	pcs	1
36		RVS-110 AT-1	Discharge arresters 110kV	Rated voltage of the arrester (Ur) - 108 kV Line discharge class - 2	3EL2 108-2PJ31-4TA1-Z Siemens	3 phase set	1

37	Southern	AT-1	Bushing 330 kV	Type GSB 362\1600\0.66B Rated voltage - 330 kV Rated current - 1600A	No.	pcs	1
38		2T	Bushing 110 kV	110 kV 800A bushing type BRIT R-110-550\800 No. KN 1.9.005-RY Rated voltage - 110 kV Rated current - 800A	EBRGL-126-800-2360	pcs	2
39		5AT	Autotransformer 330 kV	Type ATDTN-200000/330/110/10, three-phase, capacity - 200 000 kVA HV/MV/LV voltages - 330/110/10 kV	ATDTN -200000/330/110/10 ZTR	set	1
40		2AT	Autotransformer 330 kV	Type ATDTN-200000/330/110/10, three-phase, capacity - 200 000 kVA HV/MV/LV voltages - 330/110/10 kV	ATDTN -200000/330/110/10 ZTR	set	1
41		2AT	Bushing 330 kV	Type GMT II - 45-330/1000 U1 Rated voltage - 330 kV Rated current - 1000A	DTOI-363\1000\T600	pcs	1
42		2AT	Bushing 110 kV	Type GMTB-90-110/2000 UHL1 Rated voltage - 110 kV Rated current - 2000A	GBRGL-126\2000-2460	pcs	1
43		SA-330-2AT	Discharge arresters 330kV	Type RVMG-330 Rated voltage (Ur) - 330 kV Line discharge class - 2	PEXLIM Q288-YH 362, 3EL2-288-3PM42-4NA1 362, 3EQ1 288-2PP32-4NF1	pcs	3
44		R-VT-330-1C	Disconnecter 330kV, with one earthing switch	Type RNDZ-1b-330/3200 Rated voltage - 330 kV Rated current - 3200 (2000) A	CBD-E 362-2000	3 phase set	1
45		VT-330-1C	Voltage transformer 330 kV	Type TEMP-362 Gas-insulated anti-resonant Nominal voltage - 330000/ $\sqrt{3}$ / 100/ $\sqrt{3}$ / 100 / 100/ $\sqrt{3}$ Power of secondary windings not less than 100VA		pcs	3
46		AT-1	Autotransformer 330kV	Type ATDTN-250000/330/110/35, three-phase, capacity - 250 000 kVA HV/MV/LV voltages - 330/150/35 kV	ATDTSN -200000/330/150/35 ZTR	set	1
47		SA-150-1AT	Surge arrester 150kV	Type PEXLIM Q 198 XH 245 Rated voltage (Ur) - 245 kV Line discharge class - 2	3EL3 276-4PL52-4XE1	pcs	3

48	Southern	AT-332-2	Disconnecter 330kV, with two grounding knives	Type RNDZ-2-330-3200 Rated voltage - 330 kV Rated current - 3200 (2000) A	CBD-E 362-2000	3 phase set	1
49		SA-AT-331	Surge arrester 330kV	Type PEXLIM Q288-YH 362 Rated voltage (Ur) - 362 kV Line discharge class - 2	3EL2-288-3PM42-4NA1 362, 3EQ1 288-2PP32-4NF1	pcs	3
50		L-223-01, L-223-1	Disconnecter 330kV, with two earthing switches	Type S2DAT2T-330\3150 Rated voltage - 330 kV Rated current - 3150 (2000) A	CBD-E 362-2000	3 phase set	2
51		EV-L-223\1	Circuit breaker 330 kV	Type GL-315 Rated voltage - 330 kV Rated current - 3150A Current disconnect. Short-circuit current - 50 kA	LTB-420, 3AP2 FI-420	3 phase set	1
52		BP-AT-333	Discharge arresters 330kV	Type RVMG-330 Rated voltage (Ur) - 362 kV Line discharge class - 2	PEXLIM Q288-YH 362, 3EL2-288-3PM42-4NA1 362, 3EQ1 288-2PP32-4NF1	pcs	3
53		RV-RSh-Don, RV-L-Don	Discharge arresters 750 kV	Type RVMK-750M Rated voltage (Ur) - 750 kV Line discharge class - 2	SB 612/20.5-II, 3EQ3 612-5PU53-4NE1, TEKSLIM T588-AH800ME	pcs	6
54		L-Don\1, L-Don\2	Circuit breaker 750 kV	Type LTB-800E-4000-40 Rated voltage - 750 kV Rated current - 4000A Current disconnect. Short-circuit current - 40 kA	No.	3 phase set	2
55		1TN-L-Dn, 2TN-L-Dn	Voltage transformer 750 kV	Type NDE-750-72U1 Gas-insulated anti-resonant Nominal voltage - $750000/\sqrt{3}$ / $100/\sqrt{3}$ / 100 / $100/\sqrt{3}$ Power of secondary windings not less than 100VA		pcs	6
56		AB-1	Accumulator battery	Type SK-10 Battery voltage - 230 V Cell voltage - 2 V Capacity - 360 Ah Service life - not less than 20 years		set	1

57	Northern	V ROM-ChNPP	Circuit breaker 750 kV	Rated voltage - 750 kV Rated current - 4000A Current off. Short-circuit current - 40 kA gas-insulated	GL 318	set	1
58		CT B-750 CHNPP	Current transformer 750 kV	Gas-fired Rated voltage - 330 kV Transformation ratio - 4000-3000-2000-1500/1 Accuracy class - 0.2S/0.2S/5P/5P/5P/5P	SAS-800	phase	1
59		R ROM ChNPP	Disconnecter 750 kV	Unom - 750 kV In - 3150A with one earthing switch	analog of RPG-1-750/3150	3 phase set	1
60		SA-750 ROM-ChNPP	Surge arrester 750 kV	Rated voltage of the arrester (Ur) - 612 kV Line discharge class - 2	3EQ4 612-4PV57-4XZ9-Z	3 phase set	1
61		RV-330 AT-2	Discharge arrester 330 kV	Rated voltage of the surge arrester (Ur) - 288 kV Line discharge class - 2		3 phase set	1
62		RV-330 1AT	Discharge arrester 330 kV	Rated voltage of the surge arrester (Ur) - 288 kV Line discharge class - 2		3 phase set	1
63		RV-150 1AT	Discharge arrester 150 kV	Rated voltage of the surge arrester (Ur) - 138 kV Line discharge class - 3	3EL3 138-2PM31-4NE1 Siemens	3 phase set	1
64		RV-330 AT-2	Discharge arrester 330 kV	Rated voltage of the arrester (Ur) - 288 kV Line discharge class - 2	3EL2-288-3PM42-4NA Siemens SB 288/20.4-I TRIDELTA PEXLIM Q 288-XH 362 HITACHI-ABB	3 phase set	1
65		RV-150 AT-2	Discharge arrester 150 kV	Rated voltage of the arrester (Ur) - 108 kV Line discharge class - 2	3EL2 108-2PJ31-4TA1-Z Siemens	3 phase set	1
66		Reserve-2	Circuit breaker 110 kV	Rated voltage - 110 kV Rated current - 4000A Current off. Short-circuit current - 40 kA gas-insulated	LTB 145 D1/B	3 phase set	1
67	CU L-SU NPP	Current transformer 750 kV	Gas-insulated Rated voltage - 330 kV Transformation ratio - 4000-3000-2000-1500/1 Accuracy class - 0.2S/0.2S/5P/5P/5P/5P	SAS-800	phase	1	

Preliminary list of the equipment needed for CHP restoration

№	Equipment
Unit-1	
1	SF6 Circuit Breaker type LTB145D1/B
2	Current transformer type IMB 123
3	Transformer type TDC 125000/110
4	Line + descents type (AC 240)
5	Single-pole earthing knife of transformer type ZON-110M-I UHL1
6	Conductor type TZMEP-10 (6 KV)
7	Measurement and control equipment & automatics (type and quantity to be specified)
8	Pipelines of the fire extinguishing system Du-159
9	Hydraulic couplings type VOITH 620 SVNL 33G
10	Ejectors type EP-3-2A

Preliminary list of the equipment needed for CHP restoration

Unit-2

1	Turbogenerator - TVF-120-2-U3
2	Thyristor excitation system for the turbine generator type SVTG-3.85/375-1KS2T2.5-AR24-UHL4
3	A set of panels of electrical protection and automation based on PM RPA "Diamant"
4	Conductor of generator type IPB-AI-E-15, 75-8000-460-UHL1
5	SF6 Circuit Breaker type GL-312 F1/4031
6	Surge arrester type PEXLIM R108-YV123
7	SF6 Circuit Breaker type LTB145D1/B
8	Line + descents type (AC 300)
9	Transformer type TRDNS-25000/10
10	Conductor type TZMEP-10 (6 KV)
11	Measurement and control equipment & automatics (type and quantity to be specified)
12	Pipelines of the fire extinguishing system Du-159
13	Ejectors type EP-3-2A
14	Hydraulic coupling type VOITH 620 SVNL 33G
15	Electric drives Exlar GSX30-06-02-MFA-MN1-238-AR-L2-XM-47985

Preliminary list of the equipment needed for CHP restoration

Unit-3

- | | |
|---|--|
| 1 | Pipeline of network water with a diameter of 1200 mm and tees |
| 2 | Gate valves DN800 type 30s927nzh |
| 3 | Pumping units type 500D-22; D1600-30 |
| 4 | Cable products (type and quantity to be specified) |
| 5 | Measurement and control equipment & automatics (type and quantity to be specified) |

Transformer 10T

- | | |
|---|--|
| 1 | Descent from the disconnecter (AC 240) |
| 2 | Conductor type TZMEP-10 (6 KV) |

Second power supply of transformer 20T

- | | |
|---|--|
| 1 | SF6 Circuit Breaker type GL-312 F1/4031 |
| 2 | Current transformer type TFZM -123 II-IV U1 |
| 3 | Disconnecter type (SDF 145/1600) |
| 4 | Single-pole earthing knife of transformer type ZON-110M-I UHL1 |

The list of destroyed (damaged) equipment will be supplemented as the rubble is cleared

List of needed equipment to recover TPP

#	Priority	Infrastructure	Item name and specification	Unit	Quantity	Unit price, mln \$	Costs, mln \$	Recovery date (if the equipment is delivered on the specified date)	Potential supplier**	Impact
1	1	Generation	Power unit transformer 250 MVA 220 kV / 15.75 kV	pcs	2	2.5	5	July 2024 (01.06.2024)	ZTR (Ukraine), GE, Siemens	+242 MW of generating capacity, electricity and heat supply for 193.6 thousand people
2	1	Generation	Power unit transformer 250 MVA 330 kV / 15.75 kV	pc	1	2.5	2.5	July 2024 (01.06.2024)	ZTR (Ukraine), GE, Siemens	+150 MW of generating capacity, electricity and heat supply for 120 thousand people
3	1	Transmission	Autotransformer 240 MVA / 330 kV / 220 kV / Yauto/d-11	pc	1	2.3	2.3	May 2024 (01.05.2024)	ZTR (Ukraine), GE, Siemens	Ensuring the transmission of electricity between lines with different voltage classes and improving grid reliability
4	1	Transmission	Autotransformer 210 MVA / 400 kV / 330 kV / Yauto/d-11	pcs	3	2.6	7.8	July 2024 (01.07.2024)	ZTR (Ukraine), GE, Siemens	Ensuring the transmission of electricity between lines with different voltage classes and improving grid reliability
5	1	Transmission	Autotransformer 133 MVA / 400 kV / 220 kV / Yauto/d-11	pc	1	2.3	2.3	October (01.10.2024)	ZTR (Ukraine), GE, Siemens	Ensuring the transmission of electricity between lines with different voltage classes and improving grid reliability
6	1	Transmission	Autotransformer 250 MVA / 330 kV / 150 kV	pcs	2	3.5	7	June 2024 (01.05.2024)	ZTR (Ukraine), GE, Siemens	Ensuring the transmission of electricity between lines with different voltage classes and improving grid reliability
7	1	Generation	Power unit transformer 400 MVA /154 kV / 20 kV	pc	1	3.4	3.4	November 2024 (01.10.2024)	ZTR (Ukraine), GE, Siemens	+ 290 MW of generating capacity, electricity and heat supply for 232 thousand people
8	1	Generation	Power unit control system + TCS + turbine excitation system	pcs	2	2.1	4.2	May 2024 (01.05.2024)	ABB, Siemens, Emerson, Schneider Electric	Critically needed for the repair of power units No. 3-4
9	1	Generation	Power unit transformer 250 MVA / 150 kV / 18 kV	pc	1	2.9	2.9	May 2024 (01.05.2024)	ZTR (Ukraine), GE, Siemens	+ 124 MW of generating capacity, electricity and heat supply for 99.2 thousand people
10	1	Transmission	Autotransformer 400 MVA / 330 kV / 150 kV	pcs	2	3.2	6.4	September 2024 (15.09.2024)	ZTR (Ukraine), GE, Siemens	Ensuring the transmission of electricity between lines with different voltage classes and improving grid reliability
11	2	Generation	Auxiliary transformer 35 MVA	pcs	5	0.55	2.75	May 2024 (10.05.2024)	ZTR (Ukraine), GE, Siemens	+ 565 MW of generating capacity, electricity and heat supply for 452 thousand people
12	2	Generation	Equipment to recover power unit #9	pc	1	11.6	11.6	2025 (01.12.2024)	ABB, Siemens, Emerson, Schneider Electric	+ 185 MW of generating capacity, electricity and heat supply for 148 thousand people
13	2	Generation	Power unit transformer 200 MVA / 220 kV	pc	1	1.95	1.95	2025 (01.12.2024)	ZTR (Ukraine), GE, Siemens	+ 160 MW of generating capacity, electricity and heat supply for 128 thousand people
14	2	Generation	Equipment to recover power unit #8	pc	1	4.83	4.83	2025 (01.12.2024)	ABB, Siemens, Emerson	(№13)
15	2	Generation	Auxiliary transformer 32 MVA / 20 kV / 6,3 kV	pc	1	0.55	0.55	December 2024 (01.12.2024)	ZTR (Ukraine), GE, Siemens	Possibility to operate the station through powering its own needs
16	2	Generation	Start-up and backup transformer 32 MVA / 150 kV / 6,3 kV / 6,3 kV	pc	1	0.55	0.55	December 2024 (01.12.2024)	ZTR (Ukraine), GE, Siemens	Possibility to operate the station through powering its own needs
17	2	Generation	Excitation transformer 20 kV / 1 kV	pc	1	0.1	0.1	June (01.06.2024)	ABB	Restoration of power unit operation capability
18	2	Generation	Auxiliary transformer 40 MVA	pc	1	0.8	0.8	October 2024 (01.10.2024)	ZTR (Ukraine), GE, Siemens	Possibility to operate the station through powering its own needs
19	3	Generation	Generator 200 MW	pcs	2	16	32	2025 (01.05.2024)	Ukrainian Energy Machines, GE, Siemens	+ 329 MW of generating capacity, electricity and heat supply for 263 thousand people
20	3	Generation	Generator 300 MW	pc	1	24	24	November 2024 (01.06.2024)	Ukrainian Energy Machines, GE, Siemens	+290 MW of generating capacity, electricity and heat supply for 232 thousand people
21	3	Generation	Turbine 300 MW	pc	1	30	30	2025 (2025)	Ukrainian Energy Machines, GE, Siemens	(№21)
22	3	Generation	Generator 300 MW	pcs	2	24	48	2025 (2025)	Ukrainian Energy Machines, GE, Siemens	+ 438 MW of generating capacity, electricity and heat supply for 350 thousand people
23	3	Generation	Turbine 300 MW	pc	1	30	30	2025 (2025)	Ukrainian Energy Machines, GE, Siemens	(№22)

List of needed equipment to resume operations in CHP, GTSO, Gas Distribution

Item No.	Industry	Item name and specification	Unit	Quantity	Potential supplier	Impact
Unit 1						
1	Distribution	ERW steel pipe (DN250-1000)	m	750	AB Metal Group	Provision of natural gas to households
2	Distribution	Polyethylene pipes for combustible gas distribution PE 100 SDR-17.6	m (coil)	520	AB Metal Group	
3	Distribution	Flanged ball valve, full bore 11c336n PN16 with reducer	pcs.	24	AB Metal Group	
4	Distribution	Ball valve DN 350-1000 PN 25 (flanged)	pcs.	48	AB Metal Group	
5	Distribution	Flanged welded ball valve, full bore 11c337n DN250-300 PN25 with reducer	pcs.	24	AB Metal Group	
6	Distribution	Ball valve DN 400—600 PN 25	pcs.	28	AB Metal Group	
7	Distribution	Welded ball valve with installation above ground level DN 700	pcs.	6	AB Metal Group	
Unit 2						
1	Production	Propane freeze-out unit Q=100-6000 tcm/day	pcs.	8	Enerflex / QB Jonson / Propak Systems	Commodity gas quality assurance and improved gas condensate & LPG extraction
2	Production	Gas piston compressor with gas piston drive , Qg = 58-540 tcm/day	pcs.	10	EGS, Enerflex	
3	Production	Gas piston compressor with gas piston engine drive	pcs.	5	EGS, Enerflex	Maintaining and ramping-up gas production
4	Production	Gas turbine drive with centrifugal compressor	pcs.	6	SolarTurbines	
Unit 3						
1	Heating	Disconnecter 110kW Disconnecter 110kW PД3-1-110/1000	pcs.	7	ABB	Ensuring reliable heat supply
2	Heating	Disconnecter 110kW Disconnecter 110kW PД3-2-110/1000	pcs.	9	ABB	
3	Heating	Vacuum circuit breaker BP35HC outdoor installation, electromagnetically operated, with locking in the working position. Remote control.	pcs.	11	ABB / Schneider Electric	
4	Heating	Vacuum circuit breaker 6-10 kW BP1	pcs.	50	ABB / Schneider Electric	
5	Heating	Core switch BPC-110	pcs.	7	ABB / Schneider Electric	
6	Heating	Pump type CE 1250-140-11 with electric motor, skid-mounted	pcs.	7	Wilo	

List of needed equipment to resume operations in CHP, GTSO, Gas Distribution

Item No.	Industry	Item name and specification	Unit	Quantity	Potential supplier	Impact
Unit 4						
1	Heating	Network pump CE 800/100	set	1	Wilo SE/ Grundfos	Ensuring reliable heat supply
2	Heating	Network pump CE 1250/140	set	3	Wilo SE/ Grundfos	
3	Heating	Water treatment system for heat supply system in modular design, system capacity: 100 cubic metres/hour	system	1	ECOSOFT SPC Ltd.	
Unit 5						
1	Heating	ABB Gas circuit breaker type LTB 170 D1/B or GENERAL ENERGY GL313 F1/4031P	set	6	GENERAL ENERGY	Ensuring reliable heat supply
2	Heating	154 kV disconnecter type PД3-2-150/1000 Y1, with drive	set	14	GENERAL ENERGY / ABB	
3	Heating	Current transformer IBM (170 kV) or series TФ3M-170-I Y1, 600/5	set	6	GENERAL ENERGY / ABB	
4	Heating	Voltage transformer EMF (154 kV)	set	2	ABB	
5	Heating	Surge arrester PEXLIM Q144-XH170	set	3	Hitachi Energy	
Unit 6						
1	Heating	Power transformer 500 kVa, 6300/23V, Connection scheme wye-wye-5 and Wye-delta-100	Unit	1	LLC "ELTECHKOMP"	Ensuring reliable heat supply
2	Heating	Network pump Д-1250-125 1250tph, Head 125m 1480R/min, 630kW Voltage 6000V	Unit	1	UKRNASOSPROM	
3	Heating	Pressure regulator ITRON 3000 m3/h, Inlet pressure 0.6 bar, Outlet pressure 0.25 bar, Number of reduction lines-2	Unit	1	LLC "EPC "Yevropylad"	

List of needed equipment to resume operations in CHP, GTSO, Gas Distribution

Item No.	Industry	Item name and specification	Unit	Quantity	Potential supplier	Impact
Unit 7						
1	Heating	Power transformer ТРДНС-32000/35-У1	pcs.	1	PJSC "Zaporozhtransformator"	Ensuring reliable heat supply
2	Heating	Lube oil cooler МП-21	pcs.	4	Spetzpromarmatura	
3	Heating	Wilo Atmos GIGA-N 40/160-4/2 pump set	pcs.	1	Spetzpromarmatura	
4	Heating	Wilo Atmos GIGA-N 50/200-11/2 pump set	pcs.	2	Spetzpromarmatura	
5	Heating	Wilo SCP-200-360-HB stainless pump set	pcs.	1	Spetzpromarmatura	
6	Heating	Wilo Atmos GIGA-B 125/305-37/4-P6 pump set	pcs.	2	Spetzpromarmatura	
7	Heating	Wilo Atmos GIGA-B 80/170-30/2 pump set	pcs.	1	Spetzpromarmatura	
8	Heating	Wilo Atmos GIGA-B 65/215-22/2 pump set	pcs.	2	Spetzpromarmatura	
9	Heating	Pumping group: Wilo Yonos GIGA-N 50/200-18,5/2-R1 pump - 3 pcs with control device	pcs.	1	Spetzpromarmatura	
10	Heating	Wilo SCP 200/460HA-160/4-FC pump set	pcs.	1	Spetzpromarmatura	
11	Heating	Wilo FA10.65E pump (with FK202H-4/22 drive, EMU pump, horizontal installation)	pcs.	4	Spetzpromarmatura	
12	Heating	Wilo Atmos GIGA-N 80/200-30/2 pump set	pcs.	3	Spetzpromarmatura	
13	Heating	Wilo SCP 250/700DV-630/4/6kV-R1/E1-FC pump set with 6000 V frequency converter	pcs.	2	Spetzpromarmatura	

List of needed equipment to resume operations in CHP, GTSO, Gas Distribution

Item No.	Industry	Item name and specification	Unit	Quantity	Potential supplier	Impact	
Unit 8							
1	Storage	Above-ground ball valve DN100 PN150 (ANSI 900) with pneumatic actuator	pcs.	58	LLC "VKM-ARMATURA" / LLC "NVP"ARMA-T" / LLC OIL AND GAS EQUIPMENT PLANT / «MIK», LLC	Provision of natural gas to households, Storage of gas from foreign partners	
2	Storage	Fountain-type fitting	pcs.	6	M-EC LTD / LLC THE TRADING HOUSE ZAPIRNA ARMATYRA / LTD SPA SOUZENERGOMASH / «MIK", LLC / LLC "EKOTRANSOIL"		
3	Storage	Casing Head Assembly	pcs.	6			
4	Storage	Gate valve 2 9/16" (65 mm) 3000 psi (21Mpa)	pcs.	50			
5	Storage	Gate valve 4 1/16" (100 mm) 3000 psi (21Mpa)	pcs.	50			
6	Storage	Manual ram blow-out preventer 7 1/16" x 3000 PSI	pcs.	3			LLC Rost.energoinvest
7	Storage	High performance motor pump (60 l/s) with discharge hose L=300m.	pcs.	2			LLC AGROSPECTECH PLUS / LLC IC POZHMASHINA
8	Storage	Portable Petrol Welding Generator (200A)	pcs.	2	Honda Power Products		
9	Storage	Special off-road vehicle with a high-pressure pump	pcs.	2	UKR TRUCK, LLC / LLC IC POZHMASHINA		
11	Storage	All-terrain steamer truck	pcs.	1			
10	Storage	All-terrain tank truck (volume 10-12 m3)	pcs.	2			UKR TRUCK, LLC
12	Storage	Lifting unit for well workover with a lifting capacity of 60-80 tonnes.	pcs.	2	Kharkiv Plant of Transport Equipment LLC / Discovery Drilling Equipment (DDE) /National Oilwell Varco / Service King Mfg / STREICHER		
13	Storage	Cementing unit for repairing wells	pcs.	3	UKR TRUCK, LLC / LLC IC POZHMASHINA		
14	Storage	Gas turbine gas pumping unit of 25-32 MW	pcs.	2	Baker Hughes, Solar, Siemens		