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DESIGNATION OF

TITLE

REVISION

1

COVERING SHEET

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LIST OF DRAWINGS

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LEGEND & NOTE

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4

110V DC SINGLE LINE DIAGRAM

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PREPARED BY:

موندکو ایران

Monenco Iran



D

DESIGN PROGRESS

NIL

AZM

AKS

JVN

03.06.2021

DESIGNED BY

NIL

SIGNATURE

C

ACC. TO CLIENT COMMENT SHEET
DATED:05 FEB 2021

NIL

AZM

AKS

JVN

08.02.2021

DRAWN BY

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B

ACC. TO CLIENT COMMENT SHEET
DATED:15 JAN 2021

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AZM

AKS

JVN

30.01.2021

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06.01.2021

APPROVED BY

JVN

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AKS

JVN

25.11.2020

DATE:

25.11.2020

(DD.MM.YYYY)

REV

DESCRIPTION

DESIGN

DRAW

HEAD

APPR.

DATE

SCALE:

SIZE:

PROJECT:

KIMUKA

400/220kV SUBSTATION

DWG. TITLE:


LVDC SINGLE LINE DIAGRAM

LIST OF DRAWINGS

DWG. NO.: MT–TLD–KETCO–5393–DD–02–SB–102


SHEET: 2 OF: 4

CLIENT:



KETRACO

Kenya Electricity Transmission Co. Ltd.



THE WORLD BANK

IBRD . IDA | WORLD BANK GROUP

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



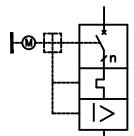














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LEGEND

	CHARGER		VOLTMETER		ENERGY METER		CONTACT
	MOLDED CASE CIRCUIT BREAKER MOTORIZED		AMMETER		VOLTAGE SELECTOR SWITCH		SWITCH
	2-POLE MINIATURE CIRCUIT BREAKER		CURRENT TRANSFORMER		UNDER(ZERO) VOLTAGE RELAY		FUSE
	BATTERY SET		SIGNAL LAMP		EARTH FAULT RELAY		
			EARTH		OVER VOLTAGE RELAY		
			DROPPING DIODE		FUSE SWITCH, 2POLE.		

NOTE:

1-THE QUANTITY, SIZE AND RATINGS ARE PRELIMINARY AND SHALL BE COMPLETED AND FINALIZED AT DETAIL DESIGN STAGE BY EPC CONTRACTOR SUBJECT TO CLIENT/CONSULTANT APPROVAL.

2-AT LEAST 20% SPARE OF EACH FEEDER TYPE SHALL BE CONSIDERED IN ADDITION TO FUTURE FEEDERS.

3-ALL CIRCUIT BREAKERS SHALL BE EQUIPPED WITH AUXILIARY CONTACT(s).

4-LVDC SINGLE LINE DIAGRAM SHALL BE SHOWN IN OPERATOR WORKSTATION WITH DYNAMIC COLORS

5-ALL MEASURING VALUES(VOLTAGE, CURRENT, REACTIVE POWER, ACTIVE POWER, FREQUENCY, POWER FACTOR, ENERGY, TEMPERATURE AND ETC) SHALL BE MONITORED THROUGH HMI AND ALL NECESSARY EQUIPMENT SUCH AS TRANSDUCERS(OF VOLTAGE, CURRENT AND ETC TYPE) SHALL BE CONSIDERED.

6-SHORT CIRCUIT CAPACITY OF BUSBAR ARE THE MIN-VALUES, AND ARE FINALIZED DUE TO ACTUAL CALCULATIONS.

7-THE CONTRACTOR SHALL PROVIDE SUB-DISTRIBUTION BOARDS AS REQUIRED SUBJECT TO CLIENT/CONSULTANT APPROVAL.

8-ALL MCBs FOR FUTURE EXTENSION AND CORRESPONDENT SPACE, ACCORDING TO GENERAL SINGLE LINE DIAGRAM, SHALL BE SUPPLIED IN MAIN LVDC PANELS IN CONTROL BUILDING.

9-ALL NECESSARY MCB's FOR OUTPUT FEEDERS SHALL BE PROVIDED.(PER CB/DS/ES MOTOR, TRIP1, TRIP2, CLOSE, MAIN/BACKUP AND ETC.)

10-DISTRIBUTION OF CB/DS/ES MOTOR DC SUPPLY IN SWITCHYARD EQUIPMENT SHOULD BE RADIAL AND FROM RELATED MARSHALLING PANELS.




11-ALL SIGNALS REQUIRED TO CONTROL THE AC/DC SYSTEM SHOULD BE CONSIDERED BY SAS.

12-110VDC BATTERY CHARGERS SHALL BE THYRISTOR CONTROLLED, SUITABLE FOR PARALLEL OPERATION WITH EACH OTHER SHARING THE LOAD, COMPLETE WITH ALL THE ACCESSORIES.

13-THE RECTIFIERS SHALL BE FED FROM THE LVAC MAIN SWITCHGEAR. DOUBLE WOUND TRANSFORMERS SHALL BE PROVIDED AT THE INPUT SIDE OF RECTIFIER TO PREVENT GALVANIC CONNECTION BETWEEN THE DC AND AC SYSTEM

14-THE INCOMINGS AND COUPLER CIRCUIT BREAKERS SHALL BE INTERCHANGEABLE WITH EACH OTHER.

15-THE CUBICLES SHALL BE COMPLETELY SELF-SUPPORTING, MADE OF A REQUIRED NUMBER OF STANDARDIZED, PREFABRICATED, VERTICAL SECTIONS BOLTED TOGETHER TO FORM INDOOR METAL CLAD, DUST-PROOF RIGID UNIT, DEGREE OF PROTECTION IP51. THE CUBICLES SHALL BE FREE STANDING, EQUIPPED WITH BOTTOM FRAMES SUITABLE FOR BOLTING TO THE FLOOR. STEEL SHEET THICKNESS SHALL NOT BE LESS THAN 2mm.

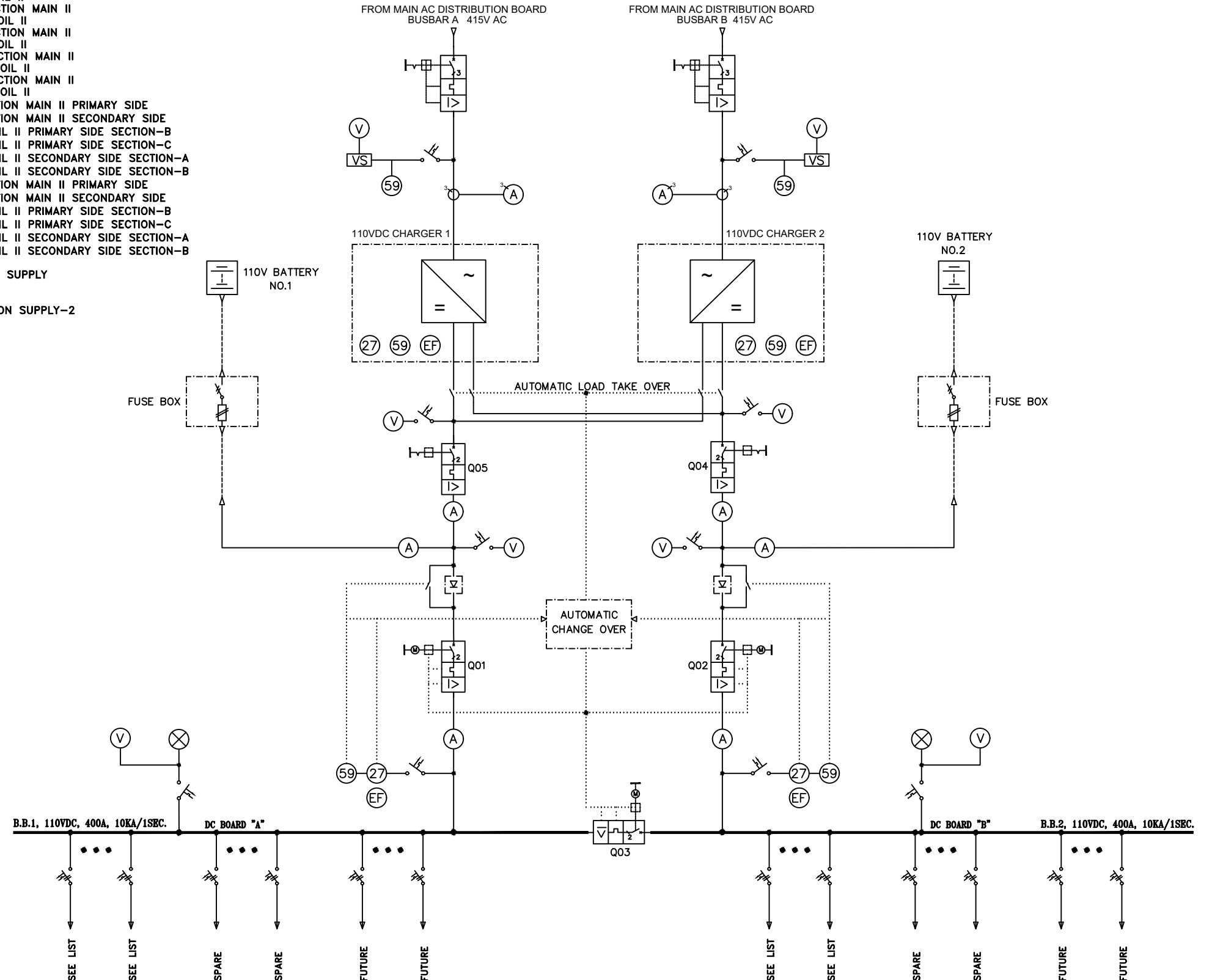
<div>PREPARED BY:</div> <div></div>							DESIGNED BY	NIL	SIGNATURE	<div>PROJECT:</div> <div><div>KIMUKA</div><div>400/220kV SUBSTATION</div></div>	<div>DWG. TITLE:</div> <div>LVDC SINGLE LINE DIAGRAM LEGEND & NOTE</div>		<div>CLIENT:</div> <div><div><div>KETRACO</div><div>Kenya Electricity Transmission Co. Ltd.</div></div><div><div><div>THE WORLD BANK</div><div>IBRD · IDA WORLD BANK GROUP</div></div></div></div>	
							DRAWN BY	STT						
	B	ACC. TO CLIENT COMMENT SHEET DATED:05 FEB 2021	NIL	AZM	AKS	JVN	08.02.2021	CHECKED BY	AKS					
	A	ACC. TO CLIENT COMMENT SHEET DATED:15 JAN 2021	NIL	AZM	AKS	JVN	30.01.2021	APPROVED BY	JVN					
	0	FIRST ISSUE	NIL	STT	AKS	JVN	25.11.2020	DATE: 25.11.2020 (DD.MM.YYYY)						
	REV	DESCRIPTION	DESIGN	DRAW	HEAD	APPR.	DATE	SCALE:			SIZE:			

FEEDER LIST BUSBAR A:

-400kV LINE ISINYA-1 CONTROL & BACKUP PROTECTION
 -400kV LINE ISINYA-1 PROTECTION MAIN I
 -400kV LINE ISINYA-1 CLOSE COIL SECTION-A
 -400kV LINE ISINYA-1 CB/DS/ES MECHANISM SECTION-A
 -400kV LINE ISINYA-1 TRIP COIL I SECTION-A
 -400kV LINE ISINYA-2 CONTROL & BACKUP PROTECTION
 -400kV LINE ISINYA-2 PROTECTION MAIN I
 -400kV LINE ISINYA-2 CLOSE COIL SECTION-A
 -400kV LINE ISINYA-2 CB/DS/ES MECHANISM SECTION-A
 -400kV LINE ISINYA-2 TRIP COIL I SECTION-A
 -400kV LINE SUSWA-1 CONTROL & BACKUP PROTECTION
 -400kV LINE SUSWA-1 PROTECTION MAIN I
 -400kV LINE SUSWA-1 CLOSE COIL SECTION-A
 -400kV LINE SUSWA-1 CB/DS/ES MECHANISM SECTION-A
 -400kV LINE SUSWA-1 TRIP COIL I SECTION-A
 -400kV LINE SUSWA-2 CONTROL & BACKUP PROTECTION
 -400kV LINE SUSWA-2 PROTECTION MAIN I
 -400kV LINE SUSWA-2 CLOSE COIL SECTION-A
 -400kV LINE SUSWA-2 CB/DS/ES MECHANISM SECTION-A
 -400kV LINE SUSWA-2 TRIP COIL I SECTION-A
 -220kV LINE KIMUKA-1 CONTROL & BACKUP PROTECTION
 -220kV LINE KIMUKA-1 PROTECTION MAIN I
 -220kV LINE KIMUKA-1 CLOSE COIL SECTION-C
 -220kV LINE KIMUKA-1 CB/DS/ES MECHANISM SECTION-C
 -220kV LINE KIMUKA-1 TRIP COIL I SECTION-C
 -220kV LINE KIMUKA-2 CONTROL & BACKUP PROTECTION
 -220kV LINE KIMUKA-2 PROTECTION MAIN I
 -220kV LINE KIMUKA-2 CLOSE COIL SECTION-C
 -220kV LINE KIMUKA-2 CB/DS/ES MECHANISM SECTION-C
 -220kV LINE KIMUKA-2 TRIP COIL I SECTION-C
 -400/220kV TRANS 1 CONTROL & BACKUP PROTECTION
 -400/220kV TRANS 1 PROTECTION MAIN I PRIMARY SIDE
 -400/220kV TRANS 1 PROTECTION MAIN I SECONDARY SIDE
 -400/220kV TRANS 1 CB/DS/ES MECHANISM PRIMARY SIDE SECTION-B
 -400/220kV TRANS 1 CB/DS/ES MECHANISM PRIMARY SIDE SECTION-C
 -400/220kV TRANS 1 CB/DS/ES MECHANISM SECONDARY SIDE SECTION-A
 -400/220kV TRANS 1 CB/DS/ES MECHANISM SECONDARY SIDE SECTION-B
 -400/220kV TRANS 1 CLOSE COIL PRIMARY SIDE SECTION-B
 -400/220kV TRANS 1 CLOSE COIL PRIMARY SIDE SECTION-C
 -400/220kV TRANS 1 CLOSE COIL SECONDARY SIDE SECTION-A
 -400/220kV TRANS 1 CLOSE COIL SECONDARY SIDE SECTION-B
 -400/220kV TRANS 1 TRIP COIL I PRIMARY SIDE SECTION-B
 -400/220kV TRANS 1 TRIP COIL I PRIMARY SIDE SECTION-C
 -400/220kV TRANS 1 TRIP COIL I SECONDARY SIDE SECTION-A
 -400/220kV TRANS 1 TRIP COIL I SECONDARY SIDE SECTION-B
 -400/220kV TRANS 1 AVR
 -400/220kV TRANS 2 CONTROL & BACKUP PROTECTION
 -400/220kV TRANS 2 PROTECTION MAIN I PRIMARY SIDE
 -400/220kV TRANS 2 PROTECTION MAIN I SECONDARY SIDE
 -400/220kV TRANS 2 CB/DS/ES MECHANISM PRIMARY SIDE SECTION-B
 -400/220kV TRANS 2 CB/DS/ES MECHANISM PRIMARY SIDE SECTION-C
 -400/220kV TRANS 2 CB/DS/ES MECHANISM SECONDARY SIDE SECTION-A
 -400/220kV TRANS 2 CB/DS/ES MECHANISM SECONDARY SIDE SECTION-B
 -400/220kV TRANS 2 CLOSE COIL PRIMARY SIDE SECTION-B
 -400/220kV TRANS 2 CLOSE COIL PRIMARY SIDE SECTION-C
 -400/220kV TRANS 2 CLOSE COIL SECONDARY SIDE SECTION-A
 -400/220kV TRANS 2 CLOSE COIL SECONDARY SIDE SECTION-B
 -400/220kV TRANS 2 TRIP COIL I PRIMARY SIDE SECTION-B
 -400/220kV TRANS 2 TRIP COIL I PRIMARY SIDE SECTION-C
 -400/220kV TRANS 2 TRIP COIL I SECONDARY SIDE SECTION-A
 -400/220kV TRANS 2 TRIP COIL I SECONDARY SIDE SECTION-B
 -400/220kV TRANS 2 AVR
 -400kV B.B.P2 PROTECTION
 -400kV B.B.P1 PROTECTION
 -220kV B.B.P2 PROTECTION
 -220kV B.B.P1 PROTECTION
 -EMERGENCY LIGHTING-1
 -METERING SUPPLY-1
 -LVAC CB MECHANISM-1
 -LVAC CONTROL AND PROTECTION SUPPLY-1
 -UPS SUPPLY-1
 -PMU SUPPLY-1
 -FUTURES
 -SPARES

FEEDER LIST BUSBAR B:

-400kV LINE ISINYA-1 PROTECTION MAIN II
 -400kV LINE ISINYA-1 TRIP COIL II
 -400kV LINE ISINYA-2 PROTECTION MAIN II
 -400kV LINE ISINYA-2 TRIP COIL II
 -400kV LINE SUSWA-1 PROTECTION MAIN II
 -400kV LINE SUSWA-1 TRIP COIL II
 -400kV LINE SUSWA-2 PROTECTION MAIN II
 -400kV LINE SUSWA-2 TRIP COIL II
 -220kV LINE KIMUKA-1 PROTECTION MAIN II
 -220kV LINE KIMUKA-1 TRIP COIL II
 -220kV LINE KIMUKA-2 PROTECTION MAIN II
 -220kV LINE KIMUKA-2 TRIP COIL II
 -400/220kV TRANS 1 PROTECTION MAIN II PRIMARY SIDE
 -400/220kV TRANS 1 PROTECTION MAIN II SECONDARY SIDE
 -400/220kV TRANS 1 TRIP COIL II PRIMARY SIDE SECTION-B
 -400/220kV TRANS 1 TRIP COIL II PRIMARY SIDE SECTION-C
 -400/220kV TRANS 1 TRIP COIL II SECONDARY SIDE SECTION-A
 -400/220kV TRANS 1 TRIP COIL II SECONDARY SIDE SECTION-B
 -400/220kV TRANS 2 PROTECTION MAIN II PRIMARY SIDE
 -400/220kV TRANS 2 PROTECTION MAIN II SECONDARY SIDE
 -400/220kV TRANS 2 TRIP COIL II PRIMARY SIDE SECTION-B
 -400/220kV TRANS 2 TRIP COIL II PRIMARY SIDE SECTION-C
 -400/220kV TRANS 2 TRIP COIL II SECONDARY SIDE SECTION-A
 -400/220kV TRANS 2 TRIP COIL II SECONDARY SIDE SECTION-B
 -METERING SUPPLY-2
 -DG CONTROL AND PROTECTION SUPPLY
 -EMERGENCY LIGHTING-2
 -LVAC CB MECHANISM-2
 -LVAC CONTROL AND PROTECTION SUPPLY-2
 -UPS SUPPLY-2
 -PMU SUPPLY-2
 -FUTURES
 -SPARES



PREPARED BY:

مونکو ایران
Monenco Iran

D	DESIGN PROGRESS	NIL	AZM	AKS	JVN	03.06.2021	DESIGNED BY	NIL	SIGNATURE
C	ACC. TO CLIENT COMMENT SHEET DATED:05 FEB 2021	NIL	AZM	AKS	JVN	08.02.2021	DRAWN BY	STT	
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PROJECT:

KIMUKA
400/220kV SUBSTATION

DWG. TITLE:

LVDC SINGLE LINE DIAGRAM
110V DC SINGLE LINE DIAGRAM

DWG. NO.: MT-TLD-KETCO-5393-DD-02-SB-102 SHEET: 3 OF: 4

CLIENT:

