ACADEMICIA

ISSN: 2249-7137 Vol.10, Issue 10, October 2020 Impact Factor: SJIF 2020 = 7.13

ACADEMICIA
An International Multidisciplinary Research Journal
(Double Blind Refereed & Peer Reviewed Journal)

DOI: 10.5958/2249-7137.2020.01221.5

STUDY OF TRANSMISSION OF ELECTRIC ENERGY THROUGH AC AND DC CURRENTS AND THEIR ANALYSIS IN A SPECIALLY ASSEMBLED LAYOUT

Jamshid Kuldashevich Ergashev*; Alisher Abdurashidovich Berkinov; Ismoil M Mo'minov***; Kamol Djurakulovich Nurmatov****; Jaxongir A Hotamov*******

[1,5]Jizzakh State Pedagogical Institute,
Jizzakh, UZBEKISTAN

ABSTRACT

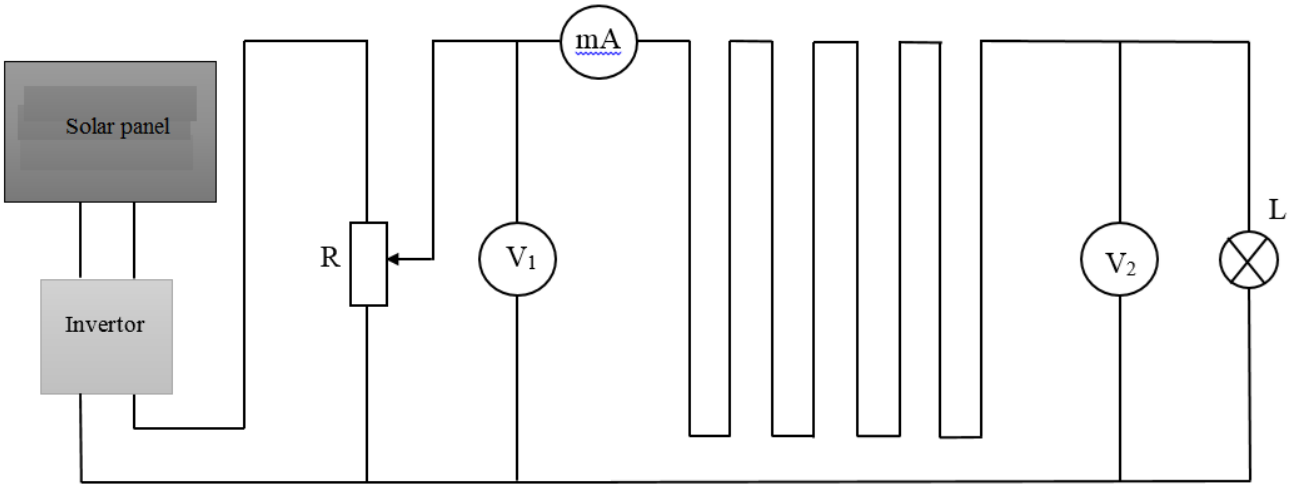
A special model was assembled to study the transmission of electricity through an alternating and alternating current overhead line, and the results obtained and the results obtained using this model describe a graph of power losses in AC (constant current) transmission and AC (constant current) transmission, depending on the transmitted power.

KEYWORDS: *Power Transmission, Direct Current, Alternating Current, Cable Lines Overhead Lines AC (Constant Current) Conductors, Power Consumption.*

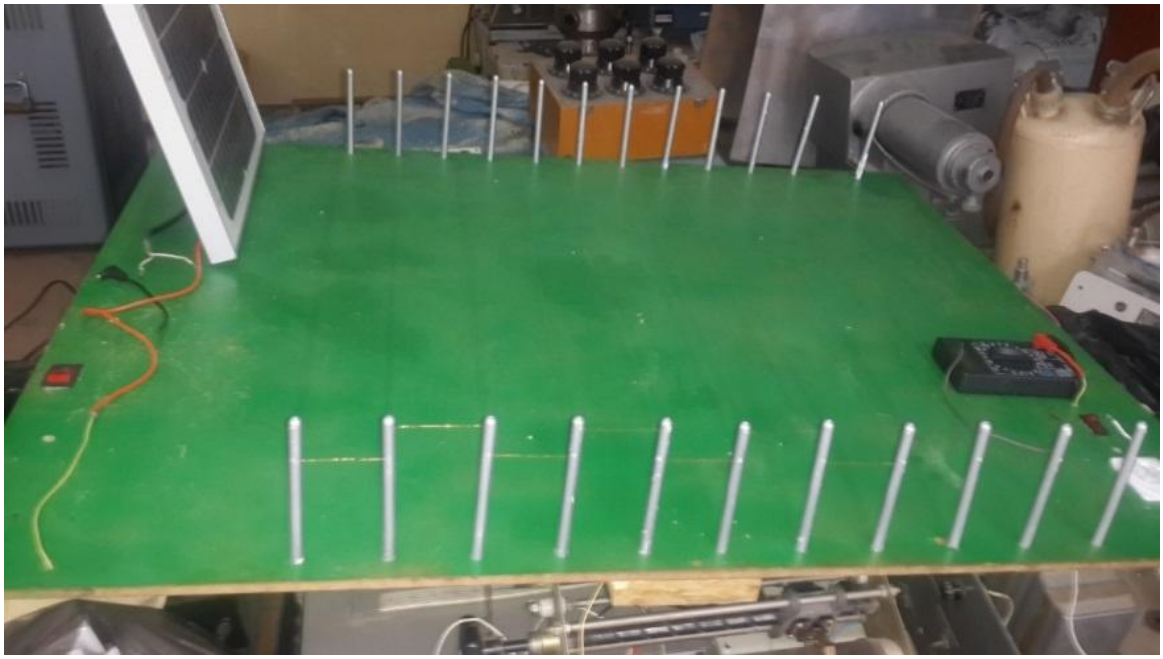
INTRODUCTION

The geographical location of our country, natural conditions, the size of its territory, the uneven distribution of mineral resources, the developing industry, testify to the fact that Uzbekistan has a wide range of alternating current facilities. Given that by 2031 Uzbekistan plans to generate 21% of total electricity generation from alternative energy sources, as well as the widespread introduction of solar and wind power plants, the use of uninterruptible power transmission will be highly efficient in the transmission of electricity to consumers. Especially in this area, given the efficiency of low-power AC (constant current) power transmission, it is advisable to use modern voltage converters based on new types of electronic devices. [1] Currently, there is a tendency for the share of natural gas to generate electricity to decrease and the share of coal to increase. Therefore, it is also advisable to use AC (constant current) power from thermal power plants in combination with AC (constant current) power transmission. Of course, this issue requires a sufficiently in-depth analysis and technical-economic research. [1]

A special model was assembled to study the transmission of electricity through an alternating and constant current overhead line. Its general appearance is depicted in Figures 1 a, b.



1 a– picture. Schematic view of the experimental device.



1 b - picture. A mock-up designed to study the transmission of electrical energy through fixed and alternating current overhead lines

The alternating current generated in the solar panel is fed to the inverter, when the breaker-connector position in the inverter is low, the alternating current at the inverter output is fed to the rheostat and the current supplied through the rheostat is passed to the LED (load). The values of the input and output voltages from the readings of the first and second voltmeters, as well as the value of the current from the readings on the milliammeter are recorded. The results obtained from the experiments are presented in Table 1 below.

U_1 (V)	I (mA)	U2 (V)	P_1 (mW)	P_2 (mW)	$\Delta P_{-}=P_1- P_2$ (mW)
1	25	0,5	25	12,5	12,5
2	68	1	136	68	68
2,5	85	1,3	212,5	110,5	102
3	105	1,5	315	157,5	157,5
3,5	120	1,7	420	204	216
4	133	2	532	266	266
4,5	150	2,3	675	345	330
5	165	2,5	825	412,5	412,5
5,5	182	2,8	1001	509,6	491,4
6	200	3	1200	600	600
6,5	218	3,3	1417	719,4	697,6
7	235	3,5	1645	822,5	822,5
7,5	250	3,8	1875	950	925
8	265	4,1	2120	1086,5	1033,5
8,5	280	4,3	2380	1204	1176
9	297	4,6	2673	1366,2	1306,8
9,5	310	4,8	2945	1488	1457
10	327	5	3270	1635	1635
10,5	340	5,3	3570	1802	1768
11	357	5,6	3927	1999,2	1927,8
11,5	372	5,8	4278	2157,6	2120,4
12	388	6,1	4656	2366,8	2289,2
12,5	400	6,3	5000	2520	2480
13	415	6,7	5395	2780,5	2614,5
13,5	435	6,8	5872,5	2958	2914,5
14	445	7,1	6230	3159,5	3070,5
14,5	460	7,3	6670	3358	3312
15	475	7,6	7125	3610	3515
15,5	485	7,8	7517,5	3783	3734,5
16	500	8,1	8000	4050	3950

If the alternating current generated in the solar panel is fed to the inverter and the breaker-connector in the inverter is switched to the upper position, an alternating voltage is obtained at the inverter output and fed to the sliding rheostat. In this case, the input and output voltages from the first and second voltmeters, as well as the currents in millimeters are recorded. The results we obtained are presented in Table 2 below.

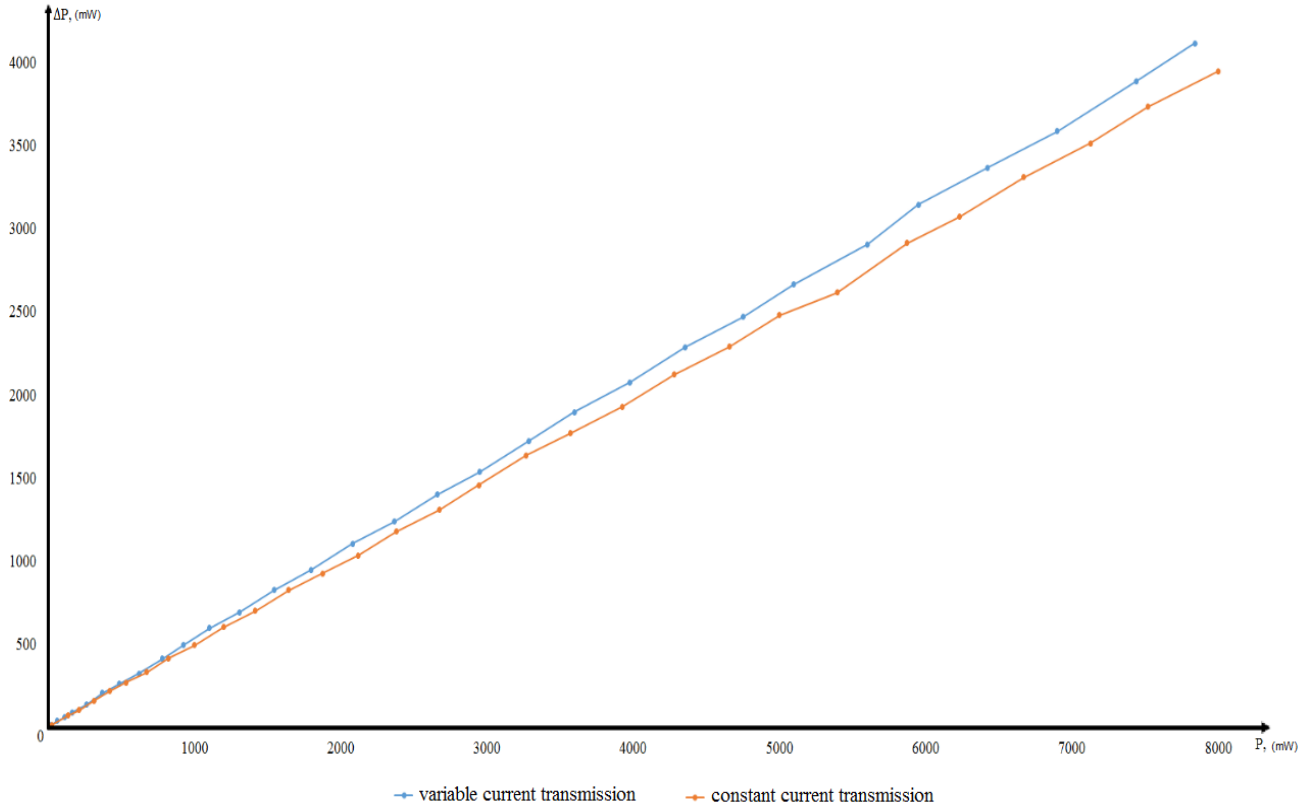
U_1 (V)	I (mA)	U_2 (V)	P_1 (mW)	P_2 (mW)	$\Delta P_{\approx}=P_1- P_2$ (mW)
1	15	0,4	15	6	9
2	32	0,9	64	28,8	35,2

2,5	45	1,2	112,5	54	58,5
3	55	1,4	165	77	88
3,5	75	1,7	262,5	127,5	135
4	93	1,8	372	167,4	204,6
4,5	108	2,1	486	226,8	259,2
5	124	2,4	620	297,6	322,4
5,5	142	2,6	781	369,2	411,8
6	154	2,8	924	431,2	492,8
6,5	170	3	1105	510	595
7	187	3,3	1309	617,1	691,9
7,5	206	3,5	1545	721	824
8	225	3,8	1800	855	945
8,5	245	4	2082,5	980	1102,5
9	263	4,3	2367	1130,9	1236,1
9,5	280	4,5	2660	1260	1400
10	295	4,8	2950	1416	1534
10,5	313	5	3286,5	1565	1721,5
11	327	5,2	3597	1700,4	1896,6
11,5	346	5,5	3979	1903	2076
12	363	5,7	4356	2069,1	2286,9
12,5	380	6	4750	2280	2470
13	392	6,2	5096	2430,4	2665,6
13,5	415	6,5	5602,5	2697,5	2905
14	425	6,6	5950	2805	3145
14,5	443	6,9	6423,5	3056,7	3366,8
15	460	7,2	6900	3312	3588
15,5	480	7,4	7440	3552	3888
16	490	7,6	7840	3724	4116

Thus, at different values of alternating and alternating current voltage, the value of the current passing through the copper wire is recorded.

After the results obtained in the experiment were processed and calculations were made, connections were made. Figure 2 shows a graph of power losses in AC (constant current) transmission and AC(constant current) transmission, depending on the transmitted power. It can be seen from the connections that the power losses in an AC (constant current) transmission at the same power transmission are different from the power losses in an alternating current transmission.

Power losses in AC (constant current) power transmission are lower than power losses in AC (constant current) power transmission.



The data obtained show that the limit of power transmitted over an AC (constant current) line is much larger than that of an AC (constant current) line and is determined only by the throughput of the converter substations. In this case, it is only necessary to take into account that the reactive power losses in the transmission of natural power through an alternating current line are compensated by the charging power of the line. When the transmitted power exceeds the natural power, the reactive power losses on the line increase sharply.

From this it can be concluded that in the transmission of high-power electricity through overhead lines, the use of transmission lines over AC (constant current) power lines leads to a reduction in the waste of electricity at high capacity

LITERATURES

1. Vidjey K. Sud. HVDC and facts controllers: Применение статических преобразователей в энергетических системах: Пер.с англ.: NP «NПА», 2009г. 164-188 ст.
2. Ergashev, J., & Berkinov, A. (2020). TOK VA KUCHLANISH O‘ZGARTIRGICHLARNING XARAKTERISTIKALARINI TAQQOSLASH. Архив Научных Публикаций JSPI.
3. Ergashev, J., & Berkinov, A. (2020). ЙИГИЛГАН МАХСУС МАКЕТ ЁРДАМИДА КУЁШ БАТАРЕЙКАСИДАН ОЛИНГАН ЭЛЕКТР ЭНЕРГИЯСИНИ УЗГАРМАС ВА

УЗГАРУВЧАН ТОК БИЛАН УЗАТИШ АФЗАЛЛИКЛАРИНИ ТАВДОСЛАШ. Архив Научных Публикаций JSPI.

4. Ergashev, J. (2020). SKANLOVCHI TUNNEL MIKROSKOPLAR. Архив Научных Публикаций JSPI.