International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

COPY RIGHT

ELSEVIER SSRN

IJIEMR Transactions, online available on 26th Decenber 2021.
Link:https://ijiemr.org/downloads/Volume-10/Issue-12
DOI: 10.48047/IJIEMR/V10/I12/14

Title: **CERTAIN FEATURES OF ELECTRICAL SUPPLY OF LECTROCHEMICAL PROTECTION DEVICES OF HIGH PRESSURE OIL AND GAS PIPES**

Volume 10, Issue 12, Pages: 73-76

Paper Authors: **Rakhmatov Davron[1], Rakhmanov Ikhtiyor[2], Bobomurodova Mekhriniso[3].**

USE THIS BARCODE TO ACCESS YOUR ONLINE PAPER

To Secure Your Paper As Per UGC Guidelines We Are Providing A Electronic Bar Code

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

CERTAIN FEATURES OF ELECTRICAL SUPPLY OF ELECTROCHEMICAL PROTECTION DEVICES OF HIGH PRESSURE OIL AND GAS PIPES

Rakhmatov Davron[1], Rakhmanov Ikhtiyor[2], Bobomurodova Mekhriniso[3].
[1]Candidate of Technical Sciences, Bukhara Engineering-Technological Institute, Bukhara, Uzbekistan.
Tel: +998914491607. E-mail:Raxmatovdavron51@mail.ru
[2,3] Master. Bukhara Engineering-Technological Institute, Bukhara, Uzbekistan.
Tel: +998934599689. E-mail: lord.rib@list.ru

Abstract: The article provides information on the process of corrosion of high-pressure oil and gas pipelines, methods of combating it and devices for the implementation of the process.

Keywords: *pipe, pressure, cathode protection, electrostatic field, stray currents, corrosion, drainage, tread, power line.*

Introduction

Delivery of oil and gas to refineries is carried out mainly under high pressure through metal pipes. An electrically conductive ionized environment is created due to the interaction of the electrostatic field created by the movement of the product inside the pipe and the aggressive interaction of the soil layer on which the pipe is laid. The potential difference in the resulting electrostatic field causes an electrical conductivity to form, resulting in the onset of a corrosion process in the metal pipe (Figure 1).

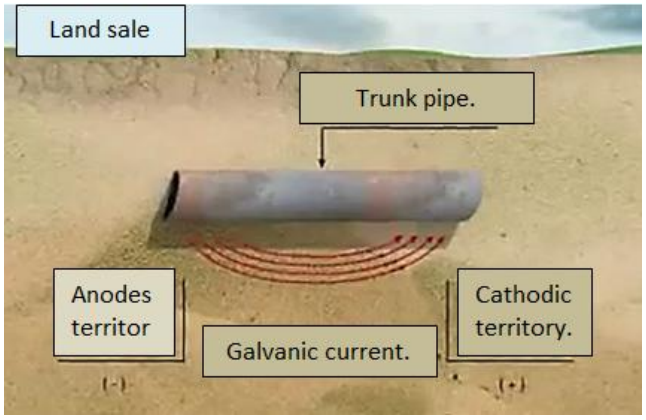

Figure 1. Occurrence of corrosion process in metal pipe.

The development of modern surface transport systems also leads to increased corrosion of product pipelines, ie corrosion of pipes also occurs under the influence of stray currents generated at the intersection of electrified transport routes (railways, subways, etc.) (Figure 2).

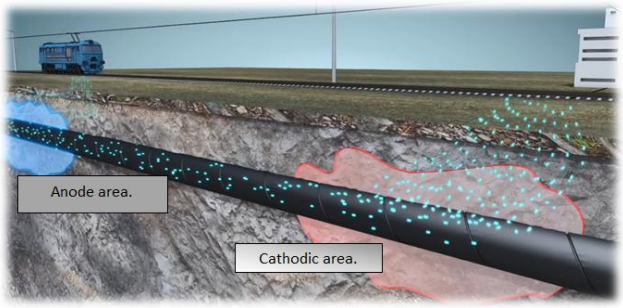

Figure 2. Impact of electrified railways on pipes.

There are several different methods and devices to combat corrosion that occur in pipes when delivering oil and gas products through pipes under high pressure, and these are mainly:

- Electric drainage device;
- Cathode protection stations;
- Protective protection.

The electric drainage device drains the currents generated in the pipes (ground) or return the lost current to the source (Figure 3).

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

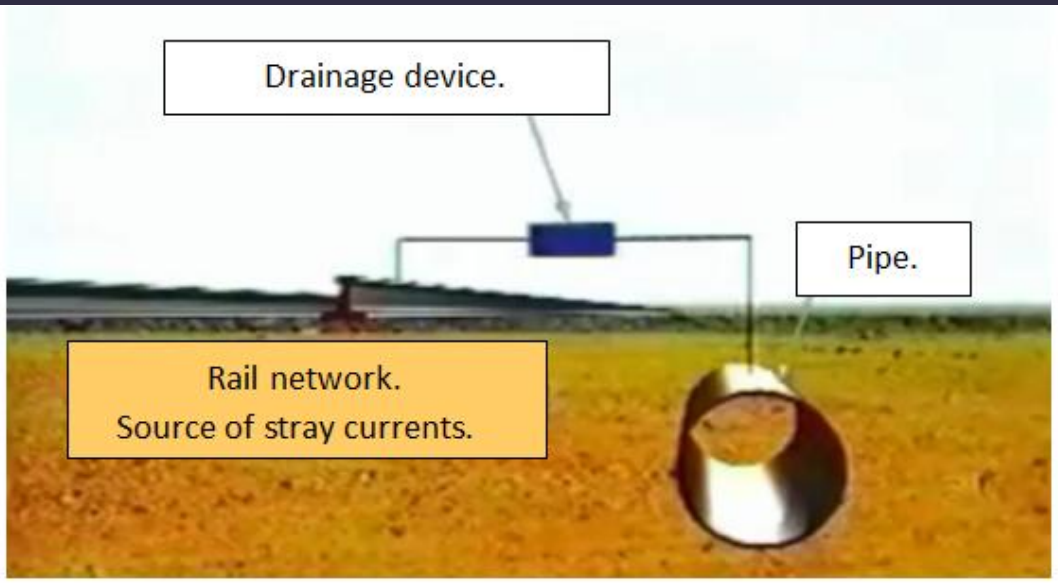

Figure 3 Electric drainage device.

Cathode protection stations ensure that the potentials generated in the pipes are shifted to the negative side (Figure 4).

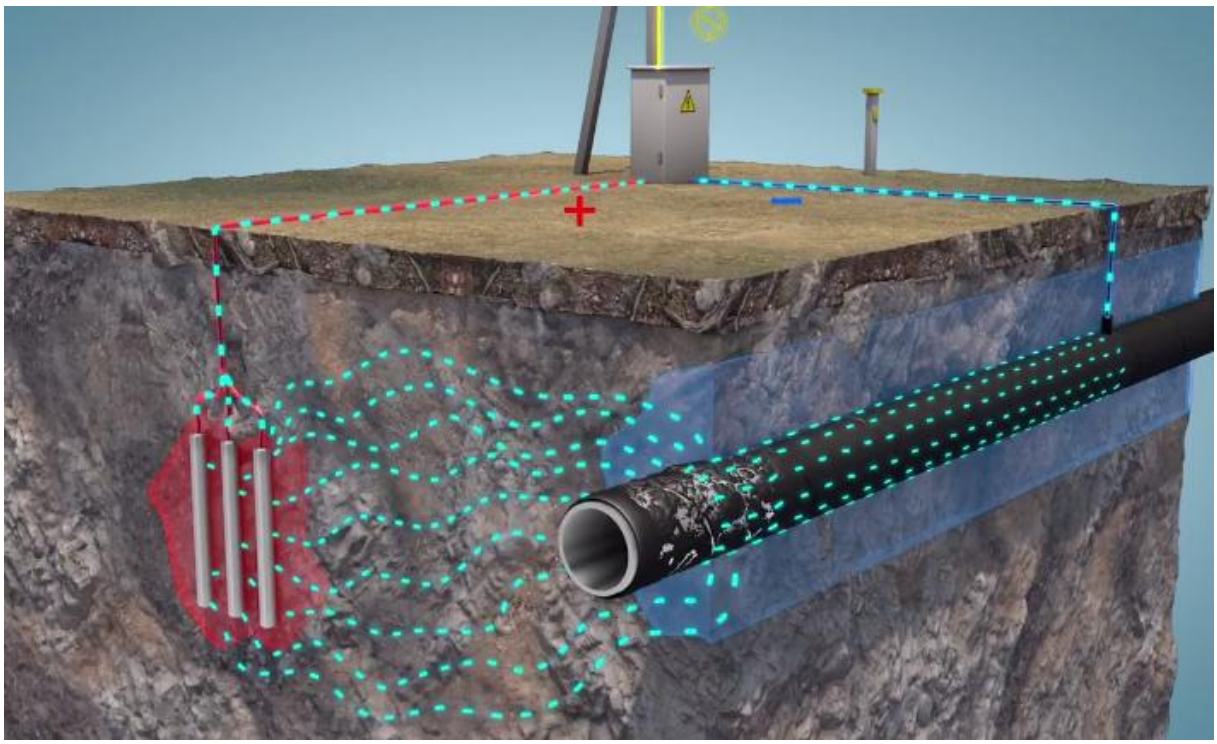

Figure 4. Cathodic protection stations.

The tread protection device consists of several treads and is connected to the pipes through a special measuring and control point (Figure 5).

International Journal for Innovative Engineering and Management Research
A Peer Revieved Open Access International Journal
www.ijiemr.org

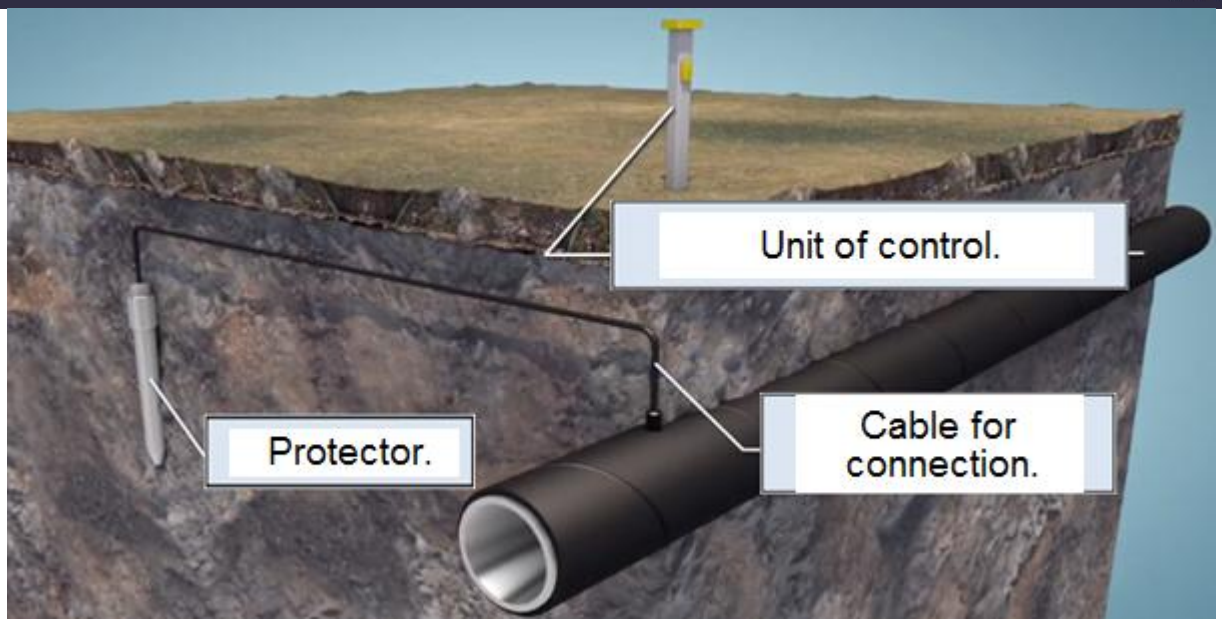

Figure-5. Protective protection device.

This device is connected to the pipe as a low-voltage AC source using special electrodes, which slows down and stops the corrosion process as a result of exposure to electron-ion currents.

The electrical drainage device and cathode protection stations are connected to a high-voltage (6-10 kV) power supply system running along the pipeline. In addition to the large expenditures on the construction of overhead transmission lines, which in turn are ground-based devices, there are regular power outages due to the fact that they are not protected from various external influences.

Conclusions based on theoretical and practical studies show that the distance between the individual cathode stations protecting the pipes should not exceed 20 km. This, in turn, requires the cathode stations to be connected to an existing part of the regional power grid. In cases where the reliability of the network to which the devices are connected is low, the presence of power outages can lead to a violation of the operating mode of the cathode stations, or a state of complete shutdown. The above facts show that there is a problem that needs to be addressed, the widespread use of electrotechnological processes in the corrosion protection of high-pressure oil and gas pipelines and the importance of scientific research in the use of modern energy-saving, advanced technical devices.

References:

1. Aginey R. V., Aleksandrov Yu. V., Nikulin S. A. Elektroximicheskaya zashchita neftegazoprovodov. Vologda, Infra-Engineering, 2020 736s.
2. Bekman V, Shvenk V. Katodnaya zashchita ot korrozii: Spravochnik. M .: Metallurgiya, 1984. - 495 p.
3. Fedorov A. A., Kameneva V.V. Osnovy elektrosnobjeniya promыshlennyx predpriyatii, M .; Energy, 1982 472 s.
4. Islom Khafizov, Komil Gafforov, Muxammedov Sh., Jurakulov A Energy saving when using a variable frequency drive in pump installations, Journal of Critical Reviews, ISSN- 2394-5125 Vol 7, Issue 12, 2020, P.99-102, http://dx.doi.org/10.31838/jcr.07.12.16
5. Khafizov I.I., Komil Gafforov, Bakhodir

Oblokulov, Aziz Azimov Elimination of energy losses in pumping installations by means variable frequency drive, International Engineering Journal For Research & Development, Vol.5, Issue 3, April 2020, E-ISSN NO:-2349-0721, Impact factor : 6.03.P.83-89, http://iejrd.com/index.php/%20/article/view/17/5

6. Khafizov I.I.,Khaitov B.B. The investigation of ions implantation processes into a single-crystal GaAs(001) in order to increase the efficiency of the solar cells, MODERN SCIENCE International scientific journal №02, 2017, Founder and publisher: "Strategic Studies Institute" LLC., Moscow, 2017, P.43-46
7. Khafizov I.I., Gafforov K.K. Application and prospects of variable frequency means in electric drives of pumping units, Международный научно-практический электронный журнал «МОЯ ПРОФЕССИОНАЛЬНАЯ КАРЬЕРА» (ISSN 2658-7998, догоров с Elibrary №284-07/2019), 15.11.2020
8. Juraev M.Q, Muzaffarov F.F, Rustamov S.Sh "Transparent Surface Lens Of Low-Temperature Solar Devices" The American Journal of Applied Sciences, 2 (10), 145-149. https://usajournalshub.com/index.php/tajas/article/view/1297
9. B.Shaymatov, D.A.Rakhmatov, A.F.Muxtorov, M.U.Rakhmatova "Probe of process of multiple - loop chains of parallel and consecutive joints". Rudenko International Conference on Methodological Problems in Reliability Study of Large Energy Systems, (RSES 2020). Scopus https://www.e3sconferences.org/articles/e3sconf/abs/2020/76/e3sconf_rses2020_01142/e3sconf_rses2020_01142.html
10. K.K.Gafforov, M.U.Rakhmatova, Sh.N.Sharipov "Three-phase corrective analysis of automatic control of pumping systems", Kazan 2020, Priority directions of innovative activity in the industry (international conference)
11. https://journals.researchparks.org/index.php/IJIE/article/view/1607
12. https://wos.academiascience.org/index.php/wos/article/view/52
13. https://reserchjet.academiascience.org/index.php/rjai/article/view/100
14. https://it.academiascience.org/index.php/it/article/view/49
15. https://ejedl.academiascience.org/index.php/ejedl/article/download/67/59/119
16. http://www.ejlss.indexedresearch.org/index.php/ejlss/article/view/283