

## ZILZILA, ZILZILANING KELIB CHIQISH SABABLARI

Muradov Sirojiddin Husan o'g'li

Qarshi muhandislik-iqtisodiyot instituti  
"Mehnat muhofazasi va texnika xavfsizligi"  
kafedrası stajyor-o'qituvchisi  
Qarshi, O'zbekistan

[sirojiddinmuradov0@gmail.com](mailto:sirojiddinmuradov0@gmail.com)

<https://doi.org/10.5281/zenodo.10876613>

**Annotatsiya.** Ushbu maqolada, zilzila haqida umumiy ma'lumotlar, ularning turlari, sinflanishi. Yer ostida va ustidagi zilzila bilan kechadigan holatlar tariflangan. Maqola mehnat muhoazasi va texnika xavfsizligi yunalishlari talablari, mehnat muhofazasi va xavfsizlik mutaxassisleri hamda keng izlanuvchilar uchun muljallangan.

**Kalit so'zlar va iboralar:** "Zilzila, silkinish, geposent, eposentr, tektonik plitalar, texnogen holatlar".

## EARTHQUAKE, CAUSES OF EARTHQUAKE

**Abstract.** In this article, general information about earthquakes, their types, classification. Earthquake conditions above and below the ground are classified. The article is intended for the requirements of labor protection and technical safety directions, labor protection and safety specialists, and general readers.

**Key words and phrases:** "Earthquake, shaking, hypocenter, epicenter, tectonic plates, man-made conditions."

## ЗЕМЛЕТРЯСЕНИЕ, ПРИЧИНЫ ЗЕМЛЕТРЯСЕНИЯ

**Аннотация.** В данной статье приведены общие сведения о землетрясениях, их типах, классификации. Классифицируются сейсмические условия над и под землей. Статья предназначена для требований направлений охраны труда и технической безопасности, специалистов по охране труда и технике безопасности, а также широкого круга читателей.

**Ключевые слова и фразы:** «Землетрясение, сотрясение, гипоцентр, эпицентр, тектонические плиты, техногенные условия».

**Kirish.** Tabiiy ofatlar ichida eng xavfli va dahshatli bu - yer silkinishidir (zilzila). Yer silkinishi - yer osti zarbasi va yer ustki qatlamining tebranishi bo'lib, tabiiy ofatlar, texnologik jarayonlar tufayli yuzaga keladi. Yer ostki zarbasining paydo bo'lish o'chog'i, yerning ostki qatlamidagi uzoq vaqt yig'ilib qolgan energiyaning ozod bo'lish jarayoni tufayli yuzaga keladi.

O'choqning ichki qismi markazi giposentr deyiladi, yerni ustki qismidagi markaz epitsentr deyiladi.

**Tadqiqot metodlari.** Tadqiqot jarayonida ilmiy va o'quv-uslubiy adabiyotlar tahlili, pedagogik-tarixiy kuzatuv, umumlashtirish, metodlaridan foydalanildi.

**Tadqiqot natijalari va muhokamalar.** Yer silkinishi yuzaga kelish sabablariga ko'ra quyidagi guruhlarga bo'linadi:

1. Tektonik zilzilalar;
2. Vulqon zilzilalari;

3. Ag'darilish, o'pirilish zilzilalari;
4. Texnogen (insonning muhandislik faoliyati bilan bog'liq) zilzilalar.

Yuqorida qayd etilgan yer silkinish turlari ichida katta maydonga tarqaladigani va eng ko'p talafot keltiradigani tektonik yer silkinishidir.

Bunday yer silkinishlar haqida gap ketganda litosfera o'ramlarida bo'ladigan harakat (tektonik kuchlar) tushuniladi.

Qiya sathlarida tog' jinslarining katta bo'laklarini ag'darilishi yoki tog'larning o'pirilishi natijasida yuzaga keluvchi yer silkinishlar ag'darilish zilzilalari deyiladi. Bu yer silkinishining tarqalish maydoni kichik, ko'p hollarda talofotsiz bo'ladi.

Vulqon jarayoni, ya'ni yer ostidagi magmani vulqon kanali orqali yer yuzasiga chiqishi bilan bog'liq bo'lgan yer silkinishiga vulqoniy yer silkinishi deb ataladi. Bunday yer silkinish vulqonning faollashishi bilan bog'liq bo'lganligi sababli aksariyat ko'p hollarda ular aniq bashorat qilinadi. Shuning uchun uning keltiradigan talofoti deyarli kuchli bo'lmaydi.

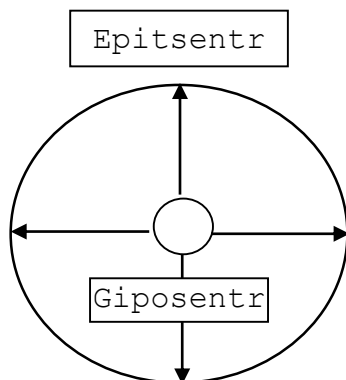
Insonning muhandislik faoliyati bilan bog'liq bo'lgan yer silkinishlar asosan oxirgi yillarda kuzatilmoqda. Bunday yer silkinish yirik suv omborlari vujudga kelgan hududlarda, gaz, neft mahsulotlarining yer ostidan so'rib olinishi jarayoni amalga oshgan maydonlarda yuz bermoqda.

Inson o'zining muhandislik faoliyati bilan yer osti komponentlariga muayyan ta'sir etishi, u yoki bu darajada o'zgartirishi yer silkinishining vujudga kelishiga sabab bo'lmoqda. Daryo vodiylariga to'g'onlarning qurilishi natijasida maydoni bir necha ming km<sup>2</sup>, hajmi bir necha yuz km<sup>3</sup> dan katta bo'lgan (masalan, Chorvoq suv omborining umumiy hajmi 2,1 mld. m<sup>3</sup>, suv sathi maydoni 3640 ga teng) suv omborlari vujudga kelmoqda. Yer qa'ridan 4000-5000 m chuqurlikda yotgan gaz, neft yer sathiga so'rib chiqarilmoqda, yer ostida uzoq geologik davrlar mobaynida yotgan ko'mir ana shu yer qa'rida yondirilib gazga aylantirib olinmoqda. Vaqtincha saqlash maqsadida ba'zan yer osti g'orlariga, chuqurlarga va tog' jinslari g'ovaklariga gaz, neft mahsulotlari yuqori bosim ostida kiritilmoqda, juda katta miqdordagi mineral suvlar yer ostidan chiqarib olinmoqda. Yer qa'rining odamlar ta'sir etish joylarida yig'ilayotgan energiya miqdorining u yoki bu darajada oshishi yoki kamayishi oqibatida sodir bo'lgan yer silkinishlar Hindiston, AQSH va O'zbekistonda kuzatilganligi fandan ma'lum. Jumladan, Chorvoq suv ombori qurilib bo'lingandan keyin bu hududda bir necha marta yer silkinishlar bo'lib o'tgan.

Tekshirishlarning ko'rsatishicha, bu yer silkinishlar o'zlarining tayyorlanish, sodir bo'lish mexanizmlari bilan Chorvoq suv omboriga yig'ilgan suvning miqdori va yig'ilgan suvni suv omboridan chiqarilish tezligi bilan bog'liq holda yuz berishi kuzatilgan. Bunga birinchidan, suv omborining 2,1 mld. m<sup>3</sup> dan ortiq suv bilan to'latilishi jarayonida, ombor tubida yotuvchi tog' jinslarining siqilishi va taranglashishi oqibatida yuz beradigan mikrosiniqlar, darz ketishlar va ularning nisbiy harakati sabab bo'lsa, ikkinchidan, suvni suv omboridan bir me'yorida chiqarilmasligi va tog' jinslariga ta'sir qiluvchi kuchlarning nomutanosib holatda bo'shatilishi, o'zgarishi sabab bo'lgan.

Yer silkinish o'chog'i - giposentrning joylashgan chuqurligi bo'yicha: yerning yuza qismida - 70 km gacha, o'rta qismida - 70-300 km va chuqur qismida - 300 km dan pastda «mantiya» qatlamida vujudga keladigan xillarini ajratish mumkin. Respublikamizda kuzatiladigan zilzilalarning o'chog'i asosan 70 km gacha chuqurliklarda joylashganligi qayd etilgan.

Mantiyadagi katta bosim yoki portlashlar tufayli zilzila o'chog'i vujudga keladi, natijada katta kuchlanishlar paydo bo'ladi, bular o'z navbatida yerning ustki qatlamining tebranishiga olib keladi. Giposentrdan hamma tarafga, qaytar seysmik to'lqinlar tarqaladi, ular asosan uzunasiga va ko'ndalang turlariga bo'linadi (sxema). Yer ostidan uzunasiga tarqalayotgan (vertikal tarzda) to'lqinlar o'z yo'nalishi bo'yicha navbatma-navbat yer po'stlog'ini siqib, er yuzasiga chiqqanda tovush chiqaradi. Bu esa yer silkinish oldidan chiqadigan tovushning o'zginasidir. Ko'ndalang to'lqinlar (gorizontal) yer yuzasiga chiqib zilzila to'lqinlarini vujudga keltiradi va epitsentrdan barcha tarafdagi tarqaladi:



Kuchli yer silkinishi oqibatida yerning yaxlitligi, butunligi o'zgaradi, inshootlar, jihozlar buziladi, kommunal-energetik qismlar ishdan chiqishi, insonlar o'limi yuz beradi. Yer silkinishi ko'pchilik hollarda ma'lum intensivlikda chiqadigan tovush bilan yuz beradi va uning past-balandligi yer qimirlashining kuchiga bog'liq. Yer qimirlashining asosiy ko'rsatkichlari quyidagilardan iborat: yer silkinish o'chog'ining chuqurligi, silkinish amplitudasi va yer silkinishining intensiv energiyasi.

**Xulosa.** MSK shkalasi bo'yicha yer silkinish kuchiga qarab quyidagi holatlar kuzatiladi:

1 ball - sezilarsiz, faqatgina seysmik asboblari qayd qiladi;

2 ball - juda kuchsiz, uy ichida o'tirgan ba'zi odamlar sezishi mumkin (deraza oynalari titraydi);

3 ball - kuchsiz, ko'pchilik odamlar sezmaydi, ochiq joyda tinch o'tirgan odam sezishi mumkin. Osilgan jismlar asta sekin tebranadi;

4 ball - o'rtacha sezilarli. Ochiq joyda, bino ichida turgan odamlar sezadi. Uy devorlari qirsillaydi. Ro'zg'or anjomlari titraydi, osilgan jismlar tebranadi;

5 ball - ancha kuchli. Hamma sezadi, uyqudagi odam uyg'onadi, ba'zi odamlar hovliga yugurib chiqadi. Idishlardagi suyuqlik chayqalib to'kiladi, osilgan uy jihozlari qattiq tebranadi;

6 ball - kuchli. Hamma sezadi, uyqudagi odam uyg'onadi, ko'pchilik odamlar hovliga yugurib chiqadi. Uy hayvonlari betoqat bo'ladi. Ba'zi hollarda kitob javonidagi kitoblar, ro'zg'or buyumlar javonlaridagi idishlar ag'darilib tushadi;

7 ball - juda kuchli. Ko'pchilik odamlarni qo'rquv bosadi, ko'chaga yugurib chiqadi, avtomobil haydovchilari harakat vaqtida ham sezadi, uy devorlarida katta -katta yoriqlar paydo bo'ladi, hovuzlardagi suv chayqaladi va loyqalanadi.

8 ball - yemiruvchi. Xom g'ishtdan qurilgan imoratlar butunlay vayron bo'ladi, ancha pishiq qilib qurilgan imoratlarda ham yoriqlar paydo bo'ladi, uy tepasidagi mo'rilar yiqiladi, ba'zi daraxtlar butun tanasi bilan yiqiladi, sinadi, tog'li joylarda qulash, surilish hodisalari yuz beradi.

9 ball - vayron qiluvchi. Yer qimirlashiga bardosh beradigan qilib qurilgan imorat va inshootlar ham qattiq shikastlanadi. Oddiy imoratlar butunlay vayron bo'ladi, yer yuzasida yoriqlar paydo bo'ladi, yer osti suvlari sizib chiqishi mumkin.

10 ball - yakson qiluvchi. Hamma imoratlar yakson bo'ladi. Temir yo'l izlari to'liqinsimon shaklga kelib bir tomonga qarab egilib qoladi, yer osti kommunal quvurlari uzilib ketadi, cho'kish hodisalari yuz beradi. Suv havzalari to'liqinlanib qirg'oqqa uriladi, qoyali yon bag'rlarda katta-katta surilish hodisalari sodir bo'ladi.

11 ball - fojiali. Hamma imoratlar deyarlik vayron bo'ladi, to'g'onlar yorilib ketadi, temir yo'llar butunlay ishdan chiqadi, yerning ustki qismida katta-katta yoriqlar paydo bo'ladi, yer ostidan balchiqlar ko'tarilib chiqadi, surilish, qulash hodisalari nihoyasiga yetadi.

12 ball - kuchli fojiali. Yerning ustki qismida katta o'zgarishlar yuz beradi. Hamma imoratlar butunlay vayron bo'ladi, daryolarning o'zani o'zgarib, sharsharalar paydo bo'ladi, tabiiy to'g'onlar vujudga keladi.

#### REFERENCES

1. Xidirova Dildora, Muradov Sirojiddin. O'zbekiston respublikasi hududida seysmoaktiv hududlar va zilzilaning xavfliligi//Innovative Development in Educational Activities. 2024. 167-172
2. Muradov S. ЭCONOMIC ANALYSIS OF PROFITS IN THE FIELD OF LABOR PROTECTION //Modern Science and Research. – 2024. – Т. 3. – №. 1. – С. 1239-1245.
3. Мурадов, С. (2024). PRINCIPLES OF ENSURING THE SAFETY OF USING LIFTING CRANES IN CONSTRUCTION-ASSEMBLY WORKS. MODERN SCIENCE AND RESEARCH, 3(2), 933–939. <https://doi.org/10.5281/zenodo.10684936>
4. МУРАДОВ СИРОЖИДДИН учитель-стажер. Каршинский инженерно-экономический институт кафедра «Охрана труда и техника безопасности» Республики Узбекистан. (2024). НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ ГРУЗОПОДЪЕМНЫХ КРАНОВ В СТРОИТЕЛЬНО-МОНТАЖНЫХ РАБОТАХ. Zenodo. <https://doi.org/10.5281/zenodo.10684166>
5. Muradov Sirojiddin. Mehnatni muhofaza qilishning tashkiliy-psixologik asoslaridagi mavjud muammolar//“Ekologiya, aholi xavfsizligi va mehnat muhofazasining hozirgi kundagi dolzarb masalalari va istiqbollari”. 2023. 133-137.
6. Muradov Sirojiddin. Mehnat sharoitlari va muhitini “kaizen” usuli yordamida takomillashtirishning innovatsion yechimlari//“Ekologiya, aholi xavfsizligi va mehnat muhofazasining hozirgi kundagi dolzarb masalalari va istiqbollari”.2023. 249-253.
7. Muradov Sirojiddin. Mehnatni muhofaza qilish sohasida yuk ortish va tushirish ishlaridagi yukchilar uchun ishlarning xavfsizligi kategori va qoidalari tahlili//“Ekologiya, aholi xavfsizligi va mehnat muhofazasining hozirgi kundagi dolzarb masalalari va istiqbollari”. 2023. 232-242

8. Muradov Sirojiddin. Mehnatni muhofaza qilishning rivojlanish tarixiy bosqichlarini o'rganish//“Ekologiya, aholi xavfsizligi va mehnat muhofazasining hozirgi kundagi dolzarb masalalari va istiqbollari”. 2023. 243-248
9. Muradov Sirojiddin. Sanoat korxonalarini rahbar va mutaxassislarining mehnat muhofazasi bo'yicha bilimlarini tekshirishni raqamli texnologiyalar asosida tashkil etishning ahamiyati//“Ekologiya, aholi xavfsizligi va mehnat muhofazasining hozirgi kundagi dolzarb masalalari va istiqbollari”. 2023. 146-150
10. Muradov Sirojiddin. Xavfli sanoat korxonalarida ishchilarni xavfli gaz va zaxarli moddalar ta'siridan himoya qilishga qaratilgan inovatsion yechimlar//“Ekologiya, aholi xavfsizligi va mehnat muhofazasining hozirgi kundagi dolzarb masalalari va istiqbollari”. 2023. 402-405
11. Muradov Sirojiddin Husan o'g'li. Sanoat korxonalarini rahbar va mutaxassislarining mehnat muhofazasi bo'yicha bilimlarini tekshirishni raqamli texnologiyalar asosida tashkil etishning ahamiyati// Aholi bandligi sohasidagi davlat siyosatining amalga oshirishning dolzarb masalalari. 2023/10/26. 180-183
12. Мурадов Сирожиддин. Определение отдыха и отпусков на основании нового трудового кодекса// Aholi bandligi sohasidagi davlat siyosatining amalga oshirishning dolzarb masalalari. 2023/10/26. 17-21
13. MURADOV SIROJIDDIN HUSAN O'G'LI. Mehnatni muhofaza qilishning rivojlanish tarixiy bosqichlarini o'rganish// Aholi bandligi sohasidagi davlat siyosatining amalga oshirishning dolzarb masalalari. 2023/10/26. 8-16
14. Muradov, S. (2023). ISHLAB CHIQRISHDAGI AVARIYALARNI O'RGANISH VA TAHLIL QILISH. Educational Research in Universal Sciences, 2(16), 474–477. Retrieved from <http://erus.uz/index.php/er/article/view/5015>
15. Muradov Sirojiddin. Ishlab chiqarishdagi avariya larni o'rganish va tahlil qilish// Educational Research in Universal Sciences, 2(16), 474–477.
16. Muradov S. ISHLAB CHIQRISHDAGI AVARIYALARNI O'RGANISH VA TAHLIL QILISH //Educational Research in Universal Sciences. – 2023. – T. 2. – №. 16. – C. 474-477.
17. Sirojiddin M., Umurzoq E. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD //International journal of advanced research in education, technology and management. – 2023. – T. 2. – №. 12. – C. 42-47.
18. Sul'tonova D. N., & Siddiqova, M. A. qizi. (2023). COLOR SCHEME IN THE FORMATION OF THE ARTISTIC ENVIRONMENT OF THE INTERIOR OF MODERN EDUCATIONAL CENTERS. Educational Research in Universal Sciences, 2(14), 109–115. Retrieved from <https://erus.uz/index.php/er/article/view/4394>
19. Sul'tonova D. N., qizi Siddiqova M. A. COLOR SCHEME IN THE FORMATION OF THE ARTISTIC ENVIRONMENT OF THE INTERIOR OF MODERN EDUCATIONAL CENTERS //Educational Research in Universal Sciences. – 2023. – T. 2. – №. 14. – C. 109-115.
20. Muradov Sirojiddin Husan o'g'li, Xakimov Xurshid Hamidulla o'g'li, & Siddiqova Madinabonu Asatilla qizi. (2021). NEW INNOVATIVE ENGINEERING SOLUTIONS TO THE PROBLEMS OF SIGNALIZATION AND SECURITY SYSTEMS. European Journal

- of Life Safety and Stability (2660-9630), 2, 28-30. Retrieved from <http://www.ejlss.indexedresearch.org/index.php/ejlss/article/view/13>
21. Muradov S. H. o'g'li, & Zayniyev, U. U. o'g'li. (2023). PRINCIPLES OF PASSING AND DOCUMENTING INSTRUCTIONS ON SAFETY TECHNIQUES. Educational Research in Universal Sciences, 2(14), 116–119. Retrieved from <http://erus.uz/index.php/er/article/view/4395>
  22. Muradov Sirojiddin Husan o'g'li, Zayniyev Ulfat Utkir o'g'li. PRINCIPLES OF PASSING AND DOCUMENTING INSTRUCTIONS ON SAFETY TECHNIQUES. Educational Research in Universal Sciences. 2023-11
  23. Sirojiddin M., Umurzoq E. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD //International journal of advanced research in education, technology and management. – 2023. – T. 2. – №. 12. – C. 42-47.
  24. Muradov Sirojiddin; Egamberdiyev Umurzoq. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD//International journal of advanced research in education, technology and management. – 2023. – T. 2. – №. 12. – C. 42-47.
  25. Husan o'g'li M. S., Hamidulla o'g'li X. X. Siddiqova Madinabonu Asatilla qizi. NEW INNOVATIVE ENGINEERING SOLUTIONS TO THE PROBLEMS OF SIGNALIZATION AND SECURITY SYSTEMS //European Journal of Life Safety and Stability (2660-9630). – 2021. – T. 2. – C. 28-30.
  26. Husan o'g'li M. S., Shavkat o'g'li E. D. INNOVATIVE SOLUTIONS TO PROTECT WORKERS FROM DANGEROUS GAS AND TOXIC SUBSTANCES IN HAZARDOUS INDUSTRY ENTERPRISES //Educational Research in Universal Sciences. – 2023. – C. 11-17.
  27. Muradov S. H. o'g'li, & Egamov, D. S. o'g'li. (2023). INNOVATIVE SOLUTIONS TO PROTECT WORKERS FROM DANGEROUS GAS AND TOXIC SUBSTANCES IN HAZARDOUS INDUSTRY ENTERPRISES. Educational Research in Universal Sciences, 2(14), 340–342. Retrieved from <http://erus.uz/index.php/er/article/view/4443>
  28. O'G E. L. A. A. et al. PHYSIOLOGICAL AND HYGIENE BASIS OF HUMAN LABOR ACTIVITY //International journal of advanced research in education, technology and management. – 2023. – T. 2. – №. 11.
  29. MURADOV SIROJIDDIN HUSAN O'G'LI; ESHPO'LATOV AZIZBEK ADHAM O'G'LI. PHYSIOLOGICAL AND HYGIENE BASIS OF HUMAN LABOR ACTIVITY// International journal of advanced research in education, technology and management.2023.266-273.
  30. Rakhimov, O. D., and S. H. Muradov. "Digitalization of Instructions on Labor Protection and Safety Techniques." European journal of life safety and stability (EJLSS) 24 (2022): 80-86.
  31. O.D. Rakhimov, Muradov S.H. Digitalization of Instructions on Labor Protection and Safety Techniques. // European journal of life safety and stability (EJLSS). 2022. №24. P.80-86.

32. O'G'LI M. S. H. ANALYSIS OF "MEASURES TO ENSURE OCCUPATIONAL SAFETY IN THE FIELD OF CARGO TRANSPORTATION AND LOADING." //International journal of advanced research in education, technology and management. – 2023. – Т. 2. – №. 9.
33. MURADOV SIROJIDDIN HUSAN O'G'LI. ANALYSIS OF "MEASURES TO ENSURE OCCUPATIONAL SAFETY IN THE FIELD OF CARGO TRANSPORTATION AND LOADING."// INTERNATIONAL JOURNAL OF ADVANCED RESEARCH IN EDUCATION, TECHNOLOGY AND MANAGEMENT. Vol. 2 No. 9 (2023). 127-133
34. ЎҒЛИ Р. Х. Ф., СИРОЖИДДИН М. ИЗУЧЕНИЯ УСЛОВИЯ ТРУДА В КОМПАНИИ ЕВРОПЫ. МУРАДОВ СИРОЖИДДИН //International journal of advanced research in education, technology and management. – 2023. – Т. 2. – №. 10.
35. ЎҒЛИ, РАЖАБОВ ХУРШИД ФАХРИДДИН, and МУРАДОВ СИРОЖИДДИН. "ИЗУЧЕНИЯ УСЛОВИЯ ТРУДА В КОМПАНИИ ЕВРОПЫ. МУРАДОВ СИРОЖИДДИН." International journal of advanced research in education, technology and management 2.10 (2023).
36. ЎҒЛИ, Р. Х. Ф., & СИРОЖИДДИН, М. (2023). ИЗУЧЕНИЯ УСЛОВИЯ ТРУДА В КОМПАНИИ ЕВРОПЫ. МУРАДОВ СИРОЖИДДИН. International journal of advanced research in education, technology and management, 2(10).
37. Rayimkulov A., Murodov S. Some Issues of Safety in the Use of Tower Cranes Used in Construction Projects //JournalNX. – С. 301-308.
38. Rayimkulov A., Murodov S. Some Issues of Safety in the Use of Tower Cranes Used in Construction Projects //JournalNX. – С. 301-308.
39. Мурадов, Сирожиддин. "ПРОБЛЕМЫ ТУШЕНИЯ ПОЖАРОВ КЛАССА Е ЛИЧНЫМ СОСТАВОМ ПОЖАРНОЙ ОХРАНЫ В МИРЕ." International journal of advanced research in education, technology and management 2.5 (2023).
40. Мурадов С. ПРОБЛЕМЫ ТУШЕНИЯ ПОЖАРОВ КЛАССА Е ЛИЧНЫМ СОСТАВОМ ПОЖАРНОЙ ОХРАНЫ В МИРЕ //International journal of advanced research in education, technology and management. – 2023. – Т. 2. – №. 5.
41. Мурадов, С. (2023). ПРОБЛЕМЫ ТУШЕНИЯ ПОЖАРОВ КЛАССА Е ЛИЧНЫМ СОСТАВОМ ПОЖАРНОЙ ОХРАНЫ В МИРЕ. International journal of advanced research in education, technology and management, 2(5).
42. Raximov O.D, Muradov S.H. SANOAT KORXONALARI RAHBARI VA MUTAXASSISLARINI MEHNAT MUHOFAZASI BO'YICHA O'QITISH VA BILIMLARINI SINOVDAN O'TKAZISHNI RAQAMLASHTIRISH. MONOGRAFIYA.2023.1-96
43. Raximov O.D, Muradov S.H. SANOAT KORXONALARI RAHBARI VA MUTAXASSISLARINI MEHNAT MUHOFAZASI BO'YICHA O'QITISH VA BILIMLARINI SINOVDAN O'TKAZISHNI RAQAMLASHTIRISH// INTELLEKT. MONOGRAFIYA.2023
44. Dustkabilovich, R. O. & o`g`li, M. S. H. (2021). Innovative Technologies in Teachingdirectors and Specialists of Industrial Enterprises on "Labor Protection". European

- Journal of Life Safety and Stability (2660-9630), 80-85. Retrieved from <http://ejlss.indexedresearch.org/index.php/ejls/article/view/3>
45. Rakhimov Oktyabr Dustkabilovich; Muradov Sirojiddin Husan o`g`li. Innovative Technologies in Teaching directors and Specialists of Industrial Enterprises on "Labor Protection" // European Journal of Life Safety and Stability (2660-9630), 2021/12/29. 80-85.
46. Muradov S.H; Safarov Sh. O`. MEHNAT SHAROITLARI VA MUHITINI "KAIZEN" USULI YORDAMIDA TAKOMILLASHTIRISHNING INNOVATSION YECHIMLARI// PAXTA TOZALASH, TO`QIMACHILIK VA YENGIL SANOAT SOHALARINING TEXNOLOGIYASINI TAKOMILLASHTIRISH. 2023. 90-92
47. СИРОЖИДДИН МУРАДОВ. ИЗУЧЕНИЯ ОХРАНА ТРУДЫ НА ПРОИЗВОДСТВЕ КОРЕИ// ХӨДӨЛМӨР, НИЙГМИЙН ХАРИЛЦАА СУДЛАЛ. 2023. 242-247
48. Muradov Sirojiddin Husan ugli; Odilov Muzaffar. MAIN INDICATORS OF LABOR PROTECTION MEASURES EFFICIENCY// INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCHS0 2023. 201-206
49. Sultonova D. N., qizi Siddiqova M. A. COLOR SCHEME IN THE FORMATION OF THE ARTISTIC ENVIRONMENT OF THE INTERIOR OF MODERN EDUCATIONAL CENTERS //Educational Research in Universal Sciences. – 2023. – Т. 2. – №. 14. – С. 109-115.
50. Muradov, S., & Usmonov H. (2024). MEHNATNI MUHOFAZA QILISHNING RIVOJLANISH TARIXIY BOSQICHLARINI O`RGANISH. *Interpretation and Researches*. извлечено от  
<https://interpretationandresearches.uz/index.php/iar/article/view/1915>
51. МУРАДОВ СИРОЖИДДИН учитель-стажер. Каршинский инженерно-экономический институт кафедра «Охрана труда и техника безопасности» Республики Узбекистан. (2024). НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ ГРУЗОПОДЪЕМНЫХ КРАНОВ В СТРОИТЕЛЬНО-МОНТАЖНЫХ РАБОТАХ. Zenodo. <https://doi.org/10.5281/zenodo.10684166>
52. СИРОЖИДДИН М. НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ ГРУЗОПОДЪЕМНЫХ КРАНОВ В СТРОИТЕЛЬНО-МОНТАЖНЫХ РАБОТАХ //International journal of advanced research in education, technology and management. – 2024. – Т. 3. – №. 2. – С. 167-177.
53. Muradov S. CONSTRUCTION-INSTALLATION ISHLARIDA KUTARAMA KRANLARDAN USE FUNDAMENTAL SECURITY OF SUPPLY //Modern Science and Research. – 2024. – Т. 3. – №. 2. – С. 786-792.
54. Muradov, S. (2024). CONSTRUCTION-INSTALLATION ISHLARIDA KUTARAMA KRANLARDAN USE FUNDAMENTAL SECURITY OF SUPPLY. *Modern Science and Research*, 3(2), 786–792. Retrieved from <https://inlibrary.uz/index.php/science-research/article/view/29479>
55. Muradov, S. (2024). ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING KTZM. *MODERN SCIENCE AND RESEARCH*, 3(2), 1142–1152. <https://doi.org/10.5281/zenodo.10701651>
56. СИРОЖИДДИН, МУРАДОВ. "РАЖАБОВ ХУРШИД ФАХРИДДИН ЎҒЛИ. ИЗУЧЕНИЯ УСЛОВИЯ ТРУДА В КОМПАНИИ ЕВРОПЫ. МУРАДОВ



- СИРОЖИДДИН." *International journal of advanced research in education, technology and management* 10 (2023): 27.
57. Sirojiddin M., Umurzoq E. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD //International journal of advanced research in education, technology and management. – 2023. – Т. 2. – №. 12. – С. 42-47.
58. Muradov S. PRINCIPLES OF ENSURING THE SAFETY OF USING LIFTING CRANES IN CONSTRUCTION-ASSEMBLY WORKS //Modern Science and Research. – 2024. – Т. 3. – №. 2. – С. 933-939.
59. Muradov S. ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING KTZM //Modern Science and Research. – 2024. – Т. 3. – №. 2. – С. 1142-1152.
60. Muradov S., Usmonov H. MEHNATNI MUHOFAZA QILISHNING RIVOJLANISH TARIXIY BOSQICHLARINI O'RGANISH //Interpretation and researches. – 2024.
61. СИРОЖИДДИН М. НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ ГРУЗОПОДЪЕМНЫХ КРАНОВ В СТРОИТЕЛЬНО-МОНТАЖНЫХ РАБОТАХ //International journal of advanced research in education, technology and management. – 2024. – Т. 3. – №. 2. – С. 167-177.
62. Muzaffar O. MAIN INDICATORS OF LABOR PROTECTION MEASURES EFFICIENCY Muradov Sirojiddin Husan ugli.
63. Muradov Sirojiddin Husan ugli; Odilov Muzaffar. MAIN INDICATORS OF LABOR PROTECTION MEASURES EFFICIENCY// [International journal of scientific researchers](#). 2023. 201-206
64. Мурадов С. ПРОБЛЕМЫ ТУШЕНИЯ ПОЖАРОВ КЛАССА Е ЛИЧНЫМ СОСТАВОМ ПОЖАРНОЙ ОХРАНЫ В МИРЕ //International journal of advanced research in education, technology and management. – 2023. – Т. 2. – №. 5.
65. Sirojiddin M., Umurzoq E. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD //International journal of advanced research in education, technology and management. – 2023. – Т. 2. – №. 12. – С. 42-47.
66. Muradov S. CONSTRUCTION-INSTALLATION ISHLARIDA KUTARAMA KRANLARDAN USE FUNDAMENTAL SECURITY OF SUPPLY //Modern Science and Research. – 2024. – Т. 3. – №. 2. – С. 786-792.
67. ФОЙДАЛАНИШ Қ. М. И. К. К., АСОСЛАРИ Х. Т. MODERN SCIENCE AND RESEARCH //MODERN SCIENCE. – 2024. – Т. 2181. – С. 3906.
68. Muradov S. ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING KTZM //Modern Science and Research. – 2024. – Т. 3. – №. 2. – С. 1142-1152.
69. KIMYOVIY K. Q. O. L. O. A., VAHOLASH H. MODERN SCIENCE AND RESEARCH //MODERN SCIENCE. – 2024. – Т. 2181. – С. 3906.
70. KIMYOVIY K. Q. O. L. O. A., VAHOLASH H. MODERN SCIENCE AND RESEARCH //MODERN SCIENCE. – 2024. – Т. 2181. – С. 3906.

71. ФОЙДАЛАНИШ Қ. М. И. К. К., АСОСЛАРИ Х. Т. MODERN SCIENCE AND RESEARCH //MODERN SCIENCE. – 2024. – Т. 2181. – С. 3906.
72. Muradov S. ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING KTZM //Modern Science and Research. – 2024. – Т. 3. – №. 2. – С. 1142-1152.
73. КИМҲОВИҲ Қ. Қ. О. Л. О. А., ВАҲОЛАШ Н. MODERN SCIENCE AND RESEARCH //MODERN SCIENCE. – 2024. – Т. 2181. – С. 3906.
74. КИМҲОВИҲ Қ. Қ. О. Л. О. А., ВАҲОЛАШ Н. MODERN SCIENCE AND RESEARCH //MODERN SCIENCE. – 2024. – Т. 2181. – С. 3906.
75. ФОЙДАЛАНИШ Қ. М. И. К. К., АСОСЛАРИ Х. Т. MODERN SCIENCE AND RESEARCH //MODERN SCIENCE. – 2024. – Т. 2181. – С. 3906.
76. Muradov, S. (2024). ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING STRONG TOXIC SUBSTANCES (KTZM). MODERN SCIENCE AND RESEARCH, 3(3), 464–472. <https://doi.org/10.5281/zenodo.1082809>
77. Muradov, S. (2024). CHEMICAL STATUS ASSESSMENT AND ANALYSIS. MODERN SCIENCE AND RESEARCH, 3(3), 455–463. <https://doi.org/10.5281/zenodo.10828083>
78. Muradov, S. (2024). STUDY AND ANALYSIS OF WORKING ACCIDENTS. MODERN SCIENCE AND RESEARCH, 3(3), 444–454. <https://doi.org/10.5281/zenodo.10828055>
79. Muradov, S. (2024). MAIN INDICATORS OF LABOR PROTECTION MEASURES EFFICIENCY. MODERN SCIENCE AND RESEARCH, 3(3), 473–484. <https://doi.org/10.5281/zenodo.10828837>
80. Muradov, S. (2024). INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD. MODERN SCIENCE AND RESEARCH, 3(3), 485–492. <https://doi.org/10.5281/zenodo.10828873>
81. Muradov, S. (2024). ENSURING SAFETY OF WORKERS IN CONSTRUCTION. MODERN SCIENCE AND RESEARCH, 3(3), 493–501. <https://doi.org/10.5281/zenodo.10828960>
82. 1MURADOV SIROJIDDIN HUSAN O'G'LI Intern-teacher of the Department of "Labor Protection and Technical Safety" of the Karshi Institute of Engineering and Economics, & ESHPO'LATOV AZIZBEK ADHAM O'G'LI 4 nd year student of the Karshi Institute of Engineering and Economics, "Labor Protection and Technical Safety" Karshi, Uzbekistan. (2023). PHYSIOLOGICAL AND HYGIENE BASIS OF HUMAN LABOR ACTIVITY. Zenodo. <https://doi.org/10.5281/zenodo.10148671>
83. Мурадов С. ПРОБЛЕМЫ ТУШЕНИЯ ПОЖАРОВ КЛАССА Е ЛИЧНЫМ СОСТАВОМ ПОЖАРНОЙ ОХРАНЫ В МИРЕ //International journal of advanced research in education, technology and management. – 2023. – Т. 2. – №. 5.
84. Мурадов Сирожиддин. (2023). ПРОБЛЕМЫ ТУШЕНИЯ ПОЖАРОВ КЛАССА Е ЛИЧНЫМ СОСТАВОМ ПОЖАРНОЙ ОХРАНЫ В МИРЕ. International Journal of Advanced Research in Education, Technology and Management, 2(5), 260–270. <https://doi.org/10.5281/zenodo.7976908>

85. Sirojiddin M., Umurzoq E. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD //International journal of advanced research in education, technology and management. – 2023. – T. 2. – №. 12. – C. 42-47.
86. Muradov Sirojiddin Intern-teacher of the Department of "Labor Protection and Technical Safety" of the Institute of Engineering Economy of Karshi, & Egamberdiyev Umurzoq 4 nd year student of the Karshi Institute of Engineering and Economics, "Labor Protection and Technical Safety Karshi city, Uzbekistan. (2023). INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD. Zenodo. <https://doi.org/10.5281/zenodo.10416639>
87. MURADOV SIROJIDDIN HUSAN O'G'LI. (2023). ANALYSIS OF "MEASURES TO ENSURE OCCUPATIONAL SAFETY IN THE FIELD OF CARGO TRANSPORTATION AND LOADING.". <https://doi.org/10.5281/zenodo.8434940>
88. Muradov S. H. Safarov Sh. O ' . MEHNAT SHAROITLARI VA MUHITINI “KAIZEN” USULI YORDAMIDA TAKOMILLASHTIRISHNING INNOVATSION YECHIMLARI //PAXTA TOZALASH, TO ‘QIMACHILIK VA YENGIL SANOAT SOHALARINING TEXNOLOGIYASINI TAKOMILLASHTIRISH. – 2023. – C. 90-92.
89. Muradov S. H. o ‘g ‘li, & Zayniyev, UU o ‘g ‘li.(2023). PRINCIPLES OF PASSING AND DOCUMENTING INSTRUCTIONS ON SAFETY TECHNIQUES //Educational Research in Universal Sciences. – T. 2. – №. 14. – C. 116-119.
90. Husan o‘g‘li M. S., Shavkat o‘g‘li E. D. INNOVATIVE SOLUTIONS TO PROTECT WORKERS FROM DANGEROUS GAS AND TOXIC SUBSTANCES IN HAZARDOUS INDUSTRY ENTERPRISES //Educational Research in Universal Sciences. – 2023. – C. 11-17.
91. Muradov, S. H. o‘g‘li, & Egamov , D. S. o‘g‘li. (2023). INNOVATIVE SOLUTIONS TO PROTECT WORKERS FROM DANGEROUS GAS AND TOXIC SUBSTANCES IN HAZARDOUS INDUSTRY ENTERPRISES. Educational Research in Universal Sciences, 2(14 SPECIAL), 340–342. Retrieved from <http://erus.uz/index.php/er/article/view/4443>
92. O‘G E. L. A. A. et al. PHYSIOLOGICAL AND HYGIENE BASIS OF HUMAN LABOR ACTIVITY //International journal of advanced research in education, technology and management. – 2023. – T. 2. – №. 11.
93. Muradov, S. (2024). ENSURING SAFETY OF WORKERS IN CONSTRUCTION. Modern Science and Research, 3(2), 493–501. Retrieved from <https://inlibrary.uz/index.php/science-research/article/view/30193>
94. Muradov S. ENSURING SAFETY OF WORKERS IN CONSTRUCTION //Modern Science and Research. – 2024. – T. 3. – №. 2. – C. 493-501.
95. МУРАДОВ СИРОЖИДДИН учитель-стажер. Каршинский инженерно-экономический институт кафедра «Охрана труда и техника безопасности» Республики Узбекистан. (2024). НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ ГРУЗОПОДЪЕМНЫХ КРАНОВ В СТРОИТЕЛЬНО-МОНТАЖНЫХ РАБОТАХ. Zenodo. <https://doi.org/10.5281/zenodo.10684166>

96. Muradov, S. (2024). CHEMICAL STATUS ASSESSMENT AND ANALYSIS. *Modern Science and Research*, 3(2), 455–463. Retrieved from <https://inlibrary.uz/index.php/science-research/article/view/30167>
97. Muradov S. CHEMICAL STATUS ASSESSMENT AND ANALYSIS //Modern Science and Research. – 2024. – T. 3. – №. 2. – C. 455-463.
98. Muradov, S. (2024). INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD. *Modern Science and Research*, 3(2), 485–492. Retrieved from <https://inlibrary.uz/index.php/science-research/article/view/30192>
99. Muradov S. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD //Modern Science and Research. – 2024. – T. 3. – №. 2. – C. 485-492.
100. Sirojiddin M., Umurzoq E. INNOVATIVE SOLUTIONS FOR IMPROVEMENT OF WORKING CONDITIONS AND ENVIRONMENT THROUGH THE KAIZEN METHOD //International journal of advanced research in education, technology and management. – 2023. – T. 2. – №. 12. – C. 42-47.
101. Muradov, S. (2024). MAIN INDICATORS OF LABOR PROTECTION MEASURES EFFICIENCY. *Modern Science and Research*, 3(2), 473–484. Retrieved from <https://inlibrary.uz/index.php/science-research/article/view/30191>
102. Muradov S. MAIN INDICATORS OF LABOR PROTECTION MEASURES EFFICIENCY //Modern Science and Research. – 2024. – T. 3. – №. 2. – C. 473-484.
103. Muradov S. ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING STRONG TOXIC SUBSTANCES (KTZM) //Modern Science and Research. – 2024. – T. 3. – №. 2. – C. 464-472.
104. Muradov S. CHEMICAL STATUS ASSESSMENT AND ANALYSIS //Modern Science and Research. – 2024. – T. 3. – №. 2. – C. 455-463.
105. Muradov, S. (2024). ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING STRONG TOXIC SUBSTANCES (KTZM). *Modern Science and Research*, 3(2), 464–472. Retrieved from <https://inlibrary.uz/index.php/science-research/article/view/30168>
106. Muradov, S. (2024). STUDY AND ANALYSIS OF WORKING ACCIDENTS. *Modern Science and Research*, 3(2), 444–454. Retrieved from <https://inlibrary.uz/index.php/science-research/article/view/30166>
107. Muradov S. STUDY AND ANALYSIS OF WORKING ACCIDENTS //Modern Science and Research. – 2024. – T. 3. – №. 2. – C. 444-454.
108. Muradov, S. (2024). ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING KTZM. *MODERN SCIENCE AND RESEARCH*, 3(2), 1142–1152. <https://doi.org/10.5281/zenodo.10701651>
109. Sirojiddin M. KTZM QO ‘LLANILADIGAN OBYEKT LARDAGI AVARIYADA KIMYOVIY HOLATNI BAHOLASH. – 2024.
110. Sirojiddin, Muradov. "KTZM QO ‘LLANILADIGAN OBYEKT LARDAGI AVARIYADA KIMYOVIY HOLATNI BAHOLASH." (2024).

111. Muzaffar O. MAIN INDICATORS OF LABOR PROTECTION MEASURES EFFICIENCY Muradov Sirojiddin Husan ugli.
112. СИРОЖИДДИН учитель-стажер, М. У. Р. А. Д. О. В. "Каршинский инженерно-экономический институт кафедры «Охрана труда и техника безопасности» Республики Узбекистан. (2024). НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ ГРУЗОПОДЪЕМНЫХ КРАНОВ В СТРОИТЕЛЬНО-МОНТАЖНЫХ РАБОТАХ. Zenodo. *НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ*.
113. СИРОЖИДДИН учитель-стажер, М. У. Р. А. Д. О. В. Каршинский инженерно-экономический институт кафедры «Охрана труда и техника безопасности» Республики Узбекистан. (2024). НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ ГРУЗОПОДЪЕМНЫХ КРАНОВ В СТРОИТЕЛЬНО-МОНТАЖНЫХ РАБОТАХ. Zenodo. *НЕКОТОРЫЕ АСПЕКТЫ БЕЗОПАСНОСТИ ПРИМЕНЕНИЯ*.
114. Muradov, S. (2024). ASSESSMENT OF THE CHEMICAL SITUATION IN AN ACCIDENT IN FACILITIES USING KTZM. MODERN SCIENCE AND RESEARCH, 3(2), 1142–1152. <https://doi.org/10.5281/zenodo.10701651>