Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas

Eureka Journal of Artificial Intelligence and Data Innovation (EJAIDI)

ISSN 2760-5000 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/11

# IMPROVING MODERN METHODS FOR ELIMINATING EMERGENCIES AT ENERGY FACILITIES

Murtazaev Eshmurod Mustafaevich
T.f.d., Professor University of
Information Technologies and Management
murtazaev_70@mail.ru

Bazarbayev Aleuatdin Sipatdin ugli
Researcher of the Academy of the
Ministry of Emergency Situations,
alewatdinbazarbaev@gmail.com

**Abstract**

The article provides a comprehensive analysis of international and national approaches to identifying, preparing for, mitigating, and responding to emergencies. The effectiveness of risk management systems is studied based on strategies developed by international organizations, as well as the national experience of the Republic of Uzbekistan. Ways to reduce the negative consequences of emergencies through community participation, coordination, planning, and medical care mechanisms are considered. During the study, existing systems were analyzed using theoretical and practical methods, and recommendations for improvement were given.

**Keywords:** Emergency, management system, international experience, security, coordination, planning, recovery, medical care, prevention.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas
Eureka Journal of Artificial Intelligence and Data Innovation (EJAIDI)
ISSN 2760-5000 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/11

## Introduction

Today, the energy sector plays a crucial role in the economic stability and development of any country. Electricity generation, transmission, and distribution systems are based on complex technological processes, and emergencies that occur in them can cause significant economic damage, environmental problems, and risks to human life.

Emergency situations (ES) occur at energy facilities as a result of man-made accidents, natural disasters, human factors, or cybersecurity threats. Therefore, the development and improvement of modern methods for their prevention and effective elimination is one of the urgent issues.

This article provides a comprehensive analysis of the types of emergencies that occur at energy facilities, their causes, modern methods of elimination, and ways to improve them.

In the modern world, the risk of natural disasters, man-made accidents and other emergencies is increasing. Therefore, it is very important to have an effective emergency prevention and elimination system to protect human life and property, to ensure socio-economic stability. Such a system consists of the following main elements:

Emergencies are events that occur as a result of natural disasters, man-made accidents, or other unexpected events and pose a serious threat to human life, health, the environment, and the economy. Emergency situations at such energy facilities are divided into the following main types:

**Man-made emergencies:**

-Accidents at power plants;
-Transformer explosions;
-Power line outages;
-Short circuits and fires.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas
OPEN ACCESS JOURNALS

Eureka Journal of Artificial Intelligence and Data Innovation (EJAIDI)

ISSN 2760-5000 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/11

The creation of an effective system for the prevention and elimination of such situations is one of the priorities of any state. The effectiveness of this system is determined by the Coordination of pre-planning, warning, response, and recovery work.

Prevention of emergency situations is a set of measures aimed at reducing the likelihood of their occurrence. This may include the following areas:

1) risk identification and assessment: occurrence of emergencies
identify possible areas, assess potential risks and determine their likelihood. This is done through geological, hydrological, Meteorological and other data analysis.

2) Construction and infrastructure: Building buildings and structures that are resistant to emergencies, increasing the reliability of engineering communications. This is achieved by adhering to standards, using modern materials and technologies.

3) Environmental protection: Rational use of natural resources, protection of the environment from pollution, forest conservation and other environmental measures help prevent emergencies.

4) Education and propaganda: informing the population about emergencies,
improve their knowledge of prevention and preparation for them.
This is done through training sessions, information campaigns, and the use of the media.

**Natural disasters related to FV**

- Earthquakes
- Storms and winds
- Freezing and severe cold
- Floods and mudslides

Emergency response includes the following actions:

1) Rapid response - in the event of an emergency, quickly respond and take the necessary measures. Effective coordination and cooperation are essential here.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas
Eureka Journal of Artificial Intelligence and Data Innovation (EJAIDI)
ISSN 2760-5000 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/11

2) Rescue and relief operations - providing assistance to victims, moving them to safety, and providing medical care through the combined efforts of rescue services, medical personnel, volunteers, and other organizations.
3) elimination of damage - cleaning of roads, restoration of damage to construction and infrastructure, restoration of utilities.
4) restoration work - reconstruction of the affected areas, normalization of the life of the population, restoration of the economy.
The causes of emergencies are due to the following factors:
- Outdated technologies and equipment
- Insufficient preventive maintenance
- Impact of climate change
- Low level of information security
- Anthropogenic factors
- Failure to comply with technical safety rules.
Creating and continuously improving an effective emergency prevention and response system is crucial to protecting human life and property. The effectiveness of this system depends on the accuracy of the risk analysis, the quality of the implementation of preventive measures, and the rapid and effective response to emergency situations.

**Modern methods of emergency response at energy facilities:**
Real-time monitoring on modern energy facilities systems are being used. To these: monitors temperature, pressure, current and voltage and vibration indicators. The result is determined before the problem occurs.
- Artificial intelligence and forecasting. These include: artificial intelligence-based systems predicts failures in advance, calculates the likelihood of emergency situations, helps to make optimal decisions.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas
OPEN ACCESS JOURNALS

Eureka Journal of Artificial Intelligence and Data Innovation (EJAIDI)

ISSN 2760-5000 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/11

**Suggestions and recommendations:**

Strengthen public-private sector cooperation, attract investment in innovative technologies, develop national security standards, and create a unified emergency platform;

Further improve the material and technical support of the Ministry of Emergency Situations of the Republic of Uzbekistan, hydrometeorological and seismological services, modernize the educational and scientific and technical base, and create decent conditions for the effective work of scientific personnel, specialists, and rescuers;

wide application of modern information and communication technologies at all stages of organizing and implementing measures to prevent and eliminate emergency situations;

Development and implementation of targeted and research programs aimed at preventing and eliminating emergencies, as well as increasing the stability of economic facilities in the event of their occurrence.

Emergency response at energy facilities requires the widespread introduction of modern technologies. Artificial intelligence and automation play an important role in this regard. At the same time, the stability and security of energy systems can be ensured by improving existing methods, increasing human resources, and studying international experience.

**References**

1. Law of the Republic of Uzbekistan “On the Protection of the Population and Territories from Natural and Man-Made Emergencies”, No. O’RQ-790 dated August 17, 2022

2. 242 of the Cabinet of Ministers of the Republic of Uzbekistan dated August 24, 2011” on further improvement of the State System of prevention and action of the Republic of Uzbekistan in emergency situations resolution.

Eureka Open Access Journals
Open Access | Peer Reviewed | International Journals | Multidisciplinary Areas
OPEN ACCESS JOURNALS

Eureka Journal of Artificial Intelligence and Data Innovation (EJAIDI)

ISSN 2760-5000 (Online) Volume 2, Issue 5, May 2026

https://eurekaoa.com/index.php/11

3. Kholbaev B.M., Rakhimov O.D., Makhmatkulov N.I. Textbook "Life Safety" (Part 2). – : "Voris-nashriyot", 2020. 304 p.
4. I.Nigmatov, M.Tojiyev.Emergency situations and civil protection. Textbook: T 2011.
5. V. A. Nemtinov. Yu. V. Nemtinova. Zh. E. Zimnukhova — Forecasting of emergency situations. – Moscow 2014 g.
6. Sh.Nazarov, ANe'matov, R. Qobulov, N. Mardonova, —Database Tashkent-2007 C200, B 34-71.
7. J.Abdurahmanov, N.Saidhojayeva, S.Holikov. Emergency
the relevance of the training of measures for elimination and their prevention. April 23-24, 2019. 150 PP.
8. A. M. Yakhyokhojaeva, N. S.Saidkhojaeva. Principles and methods of emergency management and planning in modern conditions. Academic Research in Educational Sciences Volume 3 | Issue 2 | 2022 ISSN: 2181-1385
9. A.Qosimov, J.Abdurakhmonov. The role of emergency forecasting in life safety. – Tashkent: 2021.
10.Rakhmonov B. The possibilities of IT technologies in developing students' information competence in interdisciplinary communication //Science and innovation. – 2022. – T. 1. – №. B8. – S. 509-514.
11. Rakhmonov B. A model for organizing independent learning, taking into account interdisciplinary connections in the formation of students' act competencies //Science and innovation. – 2022. – T. 1. – №. B5. – S. 285-288.