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Priority Directions for Increasing Emergency Monitoring and Forecasting Effectiveness

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Abstract: *The examination of the data on emergency circumstances reveals that the primary contributors to the risk of emergency situations are fires and other natural catastrophes associated with hazardous natural phenomena, accidents involving moving bodies of water, human-caused accidents, and terrorist attacks. Lib is a serious threat to the nation's economy, residents' safety, and the republic's ability to maintain a steady course of growth. In this regard, the prevention and elimination of emergency situations, the Ministry of Emergency Situations of the Republic of Uzbekistan, the ministries, departments and other organizations that are part of the state system of their prevention and action in emergency situations, monitoring, information exchange and forecasting of natural, man-made and ecological emergency situations single system (hereinafter referred to as the Single System) determines that it is one of the priority and urgent tasks to improve the system of risk management in emergency situations based on increasing the efficiency of monitoring of dangerous natural events and man-made processes and forecasting emergency situations.*

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The Ministry of Emergency Situations, along with other Republic executive bodies and local executive authorities and organizations acting within their purview, ensures the organization and implementation of monitoring and forecasting of emergency situations.

The major objective of the plan is to: According to the resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated April 12, 2019 No. 299 "On measures to implement the Sendai program for disaster risk reduction in the Republic of Uzbekistan in 2015-2030"

- By 2030, to achieve an increase in the effectiveness of reforms in the field of comprehensive protection of the population and territories from disasters in order to sharply reduce the number of people killed and injured as a result of disasters, as well as direct economic damage;

The main tasks of the strategy:

- improvement of the normative legal and methodical base taking into account national interests and priorities in the field of disaster risk reduction;
- monitoring of emergency situations and modernization of forecasting, reporting and information (information) delivery systems.

The following tasks are set until 2030 based on the national action plan for the implementation of the strategy for accomplishing the program's goals in the period 2019–2030:

- Improving organizational and legal foundations for disaster risk management;

- Investing in disaster risk reduction strategies;
- Improving preparation to act in the event of catastrophes.

In order to carry out this decision, the STATE PROGRAM on the implementation of the development strategy of the intended New Uzbekistan in the "Year of glorifying human dignity and active neighborhood" and for the purposes of the decree of the President of the Republic of Uzbekistan dated January 28, 2022 No. PF-60 and for 2022–2026 in that program.:

92 goal. Priority directions, goals and tasks, implementation mechanisms and forms, and deadlines for the creation of an effective system of prevention and elimination of emergency situations have been determined.

Fulfilling the requirements of the Decree of the President of the Republic of Uzbekistan "On the Strategy of Actions for the Further Development of the Republic of Uzbekistan" dated February 7, 2017 No. PF-4947, natural, man-made and ecological emergency situations, as well as their Decision No. 1027 of December 28, 2017 on the establishment of a single system of monitoring, information exchange and forecasting of natural, man-made and ecological emergency situations in order to ensure systematic monitoring, information exchange and forecasting of the consequences accepted. On the basis of this decision, the organizational-functional structure and regulations of the single system of monitoring, information exchange and forecasting of natural, man-made and environmental emergencies were approved.

Based on the decision:

- the planning and implementation of systematic monitoring and control over them; the early identification of possible sources of natural, man-made, and environmental emergency situations (hence referred to as an emergency scenario);
- offering an automatic, ongoing interchange of data on monitoring and forecasting emergency events, as well as their incidence and effects;
- predicting in advance the kind and scope of potentially harmful natural and human-made processes and events that might result in emergency situations;
- The primary responsibilities of the Unified System were identified as the creation of suggestions for the avoidance, eradication, and reduction of emergency situations, as well as for minimizing their effects.

In order to ensure the implementation of the specified tasks and implement them in practice, the President of the Republic of Uzbekistan on April 10, 2019 "On organizational measures to further improve the operation of emergency structures" No. PQ-4276 According to the Regulation on the Ministry of Emergency Situations of the Republic of Uzbekistan, the main tasks of the Ministry are:

- to take part in civil protection, fire safety, and the creation and provision of the state system for their prevention and action in emergency circumstances (hence, FVDT);
- performing seismic observations and providing thorough monitoring and forecasting of the danger of the formation and progression of emergency situations and fires;

and as functions:

- *providing thorough monitoring and forecasting of the likelihood of the emergence and progression of emergencies and fires, as well as in the area of performing seismic measurements;*
- *coordinating their efforts, developing a system for seismic measurements, and monitoring and predicting natural disasters and catastrophes;*

- *confirmed involvement in the monitoring of the environment, potentially hazardous items and plots, and the situation in the areas around.*

A road map with a list of tasks, their format and length, and a list of accountable performers was authorized in order to carry out the duties and responsibilities outlined in the rule. The application of information and communication technology in the FVV's operations as well as the establishment of a system for monitoring and predicting fires and emergency situations were identified as two of the primary initiatives in the road plan.

The Law No. O'RQ-790 dated August 17, 2022, "On Protection of Population and Territories from Natural and Man-made Emergency Situations," in particular Article 23. The primary pursuits of the state system of emergency circumstances' high readiness regime, as described in Article 24. The main measures of the state system of emergency situations, Article 27. The articles on monitoring emergency situations and foreseeing them in advance illustrate the severity of this topic.

The foundations of the state policy in the Republic of Uzbekistan regarding the protection of the people and territory from emergency circumstances are heavily reliant on the enhancement of monitoring and forecasting of emergency situations through the year 2030. In this regard, the emergency risk management system places more emphasis on timely measures to protect the population than on functional, socio-economic indicators, as in traditional management systems. Reporting was organized and is being organized taking into account the measures to minimize the time for warning, evacuation, and rescue work, minimize the number of victims (victims), and reduce the damage caused by the risks of emergency situations and support social welfare.

Based on qualitative and quantitative information about the risks, the primary objective of emergency monitoring and forecasting is to avoid their negative impact, limit the impact, and eradicate the consequences of emergency circumstances resulting from emergency situations. Making choices and getting ready are part of it. Of course, monitoring data of quickly evolving natural phenomena and man-made processes, including their key characteristics, serve as the sources of such information.

The following might be mentioned as the primary duties in emergency scenario predicting quickly:

- *the prompt and accurate identification of potential sources (such as a facility or a region) and associated warning signs;*
- *determining* the danger involved and the extent of an emergency.

The following major problems should be resolved as a goal of emergency situation forecasting:

- *the location of high-risk locations for potential emergencies;*
- *simulating several scenarios for the creation of emergency situations, tracking their quick growth, and drawing judgments about the results;*
- *evaluation of the possibility of an emergency scenario under the effect of numerous environmental elements;*
- *to develop a model for identifying the signs of the detrimental effects of risky and hazardous elements brought on by an emergency scenario and the range of influence;*
- *predicting and evaluating the presence of radiation, chemicals, engineering, fire, and other potentially harmful sources in the vicinity of an emergency;*
- *predicting and evaluating the harm done in the vicinity of a potential emergency situation;*
- *evaluation of risk indicators for the region where emergencies may occur and development of a risk map;*

Monitoring harmful processes and occurrences is keeping an eye on them, keeping them under control, and obtaining knowledge about them as well as the variables that influence how they emerge and evolve. Systems for monitoring are an essential component of many information and management systems.

The monitoring process is defined as having the following two structural components:

- *monitoring object - a natural or artificial object that is continuously observed in order to regulate the state of the environment in accordance with a particular program within the border, and analyzes and evaluates the ongoing processes and changes in them in order to determine and forecast them in advance;*
- *monitoring information - the type of information obtained as a result of regular or rapid control and monitoring* of dangerous natural and man-made processes and events that lead to emergency situations;

Monitoring of dangerous natural phenomena and man-made processes includes the following main directions:

- *monitoring of factors that have a negative impact on the environment and population;*
- *assessment of the real state of objects and natural environment;*
- *forecasting* the state of the natural environment and objects.

In both circumstances, the goal of monitoring is to gather data for the timely planning, preparation, and execution of steps to avert emergency situations. The object of monitoring can be either natural or man-made, depending on its nature and purpose.

Monitoring of hazardous natural occurrences and processes is known as natural monitoring. The Uzgidromet Service Center monitors hydrological and meteorological events over the whole nation. 130 observation locations and 136 hydrological and meteorological stations make up the monitoring system.

The set of tools stated above will track and evaluate the environment, including the air, soils, rivers, lakes, oceans, and agricultural land. It will also examine the transboundary movement of pollutants. Its responsibilities include disseminating information about hazardous natural events, excessive environmental pollution, climate change, radiation conditions on the earth's surface and in space nearby.

Procedures for measuring technological process parameters at the facility, dangerous material emissions, the status of the environment in the regions around the facility, and in the event of a disaster (accident), outside of them, are all examples of man-made monitoring.

In some high-risk facilities and their monitoring and control regions, man-made monitoring is often arranged. The radius of required nuclear power plant monitoring is specifically set at thirty kilometers.

The features of the elements with negative effect characteristics, the sources of origin, and the repercussions induced by them are examined and recorded into the database while the environment and objects are being monitored. It is possible to predict the rate of growth of the impact of negative influences on the people and facilities within the sphere of influence (zone) based on the analysis of the gathered data. It is used to evaluate the anticipated scenario, estimate the potential harm in the case of an impending disaster, avoid emergencies, restrict their scope, implement preventive measures, create a rescue plan, and guarantee the safety of the affected people.

Conclusion. Consequently, the following top priorities for enhancing the accuracy of monitoring and predicting emergency situations may be identified:

- *for the creation of a risk management system for use in emergency scenarios - creation and approval of methodological papers, regulatory legal documents, and documents governing the complex of alternative protective measures, as well as the Unified system's organizational and functional structure, depending on the nature of emergency circumstances and hazards in emergency situations;*
- *The fast evolution of potentially lethal natural processes and occurrences, as well as the forecasting of man-made risks; - The modernization of technology; - The growth of ICT-based technologies;*
- *using satellite-based remote control systems for emergencies;*
- *defining the process for developing forecast databases and models, testing models, and submitting them to the Unified system's organizational and functional structure.*
- *the establishment of centers for monitoring and predicting emergency situations in industrial facilities and high-risk industrial firms;*
- *the creation* of tools for early monitoring and forecasting of emergency situation sources, dependable emergency situation forecasting techniques, and conducting scientific research on the introduction of novel technologies in the area of public awareness and notification of emergency situations.

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