

надзор [5, с. 164]. Такая мера позволила бы упорядочить и увеличить эффективность системы экологического надзора.

В зонах повышенной экологической опасности следовало бы осуществлять деятельности по минимизации причинения вреда экологии промышленными предприятиями. Сегодня исследование масштабов загрязнения окружающей среды проводится в рамках эколого-криминологического мониторинга с использованием систем ГИКС (геоинформационных криминологических систем) и ГИПС (геоинформационных правовых систем). Актуальной задачей является разработка и использование автоматизированных систем эколого-правового мониторинга (АСЭПМ), которая позволит проектировать прогнозы внешнего воздействия на экологию и оценить возможные риски влияния негативных факторов. Эколого-криминологическая экспертиза в работе АСЭПМ позволит выявлять пробелы в законодательстве и разрабатывать рекомендации по их устранению [5, с. 165].

Таким образом, можно сделать вывод о том, что в России проблемы в области экологии существуют в связи с интенсивным развитием потребностей общества и экономики, и отчасти, с устаревшими технологиями производства, однако государство принимает соответствующие меры по решению этих проблем. Необходимо комплексно подходить к вопросам защиты окружающей среды, и решать их как с точки зрения развития и совершенствования законодательства, так и с точки зрения реструктуризации основ функционирования экономики. Особое внимание следует обратить на вопросы воспитания «культуры экологии» и развивать это социальное направление с точки зрения инвестиций в развитие экологичного понимания общества.

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Risk estimation of lightning struck an object stadium "Trud"

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A terrible tragedy occurred in a district of the Samara region. From a lightning strike directly at a football match died striker Evgeny Kirsanov (born in 1986), his teammate Mikhail Gvozdev in serious condition was taken to hospital.

During the game, a heavy rain with thunder. But "the match will take place whatever the weather" - these rules, and are used to the team and the fans. The players thought: bad weather will not interfere, and the game continued. However, the match turned out to be shocking. It was the second time, Mikhail Gvozdev had to replace Evgeny Kirsanov stood at the edge. The first and only lightning hit among players.

Nobody really understood what was happened, but the game was immediately stopped. All thought at first that the players scared or stunned shock, it turned out - everything is much worse. Kirsanov was killed instantly. Mikhail Gvozdev suffered a state of clinical death, but survived. Immediately after the tragedy he was taken to hospital Sergius. At three o'clock in the morning unconscious Gvozdeva transferred to intensive care Hospital. Kalinin. Doctors assess his condition as extremely serious.

The stadium has a lightning rod. But, as a tragedy - on the impact of elements not save any defense. This is not the first time that victims of the raging elements become footballers. Two dozen

players and referees in open terrain - very attractive target for lightning. In July 2002, it was struck by seven members of a football match held at the stadium of mine "Anniversary" in Pavlograd. Two players were killed on the field, two others were taken to the central hospital in serious condition. A few days before the lightning struck the football in Thailand. A lightning strike during a thunderstorm that broke out during a student football match, killed one student and seriously wounded another 14 players.

And in April 2002, players caught lightning in Australia. It hit the football field directly during the match. There was this unpleasant episode in the neighborhood of Melbourne. Serious burns, did not get anybody, because no direct lightning hit.

One of the worst incidents occurred in Guatemala. Two players were killed, ten received severe burns due to lightning that hit the football stadium Chikimulili. In the second half of the match the game was interrupted because of the storm, but soon after the judges decided to continue the meeting, lightning struck the iron fence that surrounded the field by shooting down all who were there on the ground. Fence create a ring of electric charge, which is in seconds burned a dozen players, coaches and referees.

32-year veteran of the Colombian Football Herman Gaviria was killed by a lightning strike during training team "Deportivo" (Kali). Four more players were hospitalized with injuries of varying severity. One of them, according to doctors, has experienced several heart attacks and miraculously survived. During warm-up the team storm began, and after yet another outbreak of four players on the field fell to the ground unconscious. Lightning struck the first goaley, and only then in the field, where the players.

The defeat of the people occurs through direct contact with their lightning; Touching the elements of the building or equipment in which the lightning current flows, or in which there is a high potential; under the influence of the voltage step resulting from the spreading of the lightning current through the earthing or the affected neighboring object through the earth. Lightning has a fairly wide range and depends on the climatic conditions and terrain. Lightning divided into two main groups: primary, initiated by a direct lightning strike, and secondary, caused by electromagnetic and electrostatic induction and introduction of high potentials in extended metal object communications. Direct lightning strike creates thermal, mechanical and electrical effects. Thermal effects associated with sudden release of heat by direct contact with the contents of the channel of lightning struck an object and the object of the current flowing through the lightning. The current from a direct lightning strike can cause unacceptable for fire heat conductor, and for a small section even melt or vaporize it. Not recommended for use in lightning protection, steel and copper wire size less than 30 mm 2 and 16, respectively.

Contact some non-combustible materials and materials with high electrical resistivity (stone, brick, concrete, wood) with the lightning channel causes a sharp steam and gas formation in them. The pressure in the formed channel rises sharply, there is an explosion or cleavage structure, such as brickwork, wooden poles and even concrete devices, where there is no contact between the elements of a good reinforcement. This forces to protect concrete structures with weak reinforcement or without a direct lightning strike.

The use of various methods for protecting buildings from lightning is done in strict accordance with their classification in terms of lightning protection devices. The instructions for lightning protection of buildings and facilities [1] objects are separated into three categories, which differ in the severity of the possible consequences of being struck by lightning. The third category such as: buildings and structures III, IIIA, IV and V degree of fire resistance, in which there are no facilities related to the explosion and fire. Also included: surface and sunken storage tanks for flammable liquids with a flash point above 45 ° C; product-pumping stations. It is known that the field of Tomsk stadium "Trud" has a display, which is used as a coolant flammable liquid.

Available at the stadium four light towers can provide protection from lightning. They can be considered as a double lightning rod, when the distance between the rod Lightning L does not exceed the limit value L_{max} [2,3,4].

The configuration of the vertical and horizontal sections of the double standard zones of protection lightning rod (height h and the distance L between the lightning conductors) is shown in Fig. 1.

Construction of the outer regions of the double lightning zones (half-cone with dimensions h_0 , r_0) is produced using the formulas for single lightning rods. Dimensions of the inner regions defined by the parameters of h_0 and h_c , the first of which specifies the maximum height of the zone directly from lightning, and the second - the minimum height of the zone midway between the lightning rods. When the distance between the lightning conductors $L \leq L_c$ border area does not have a sag ($h_c = h_0$).

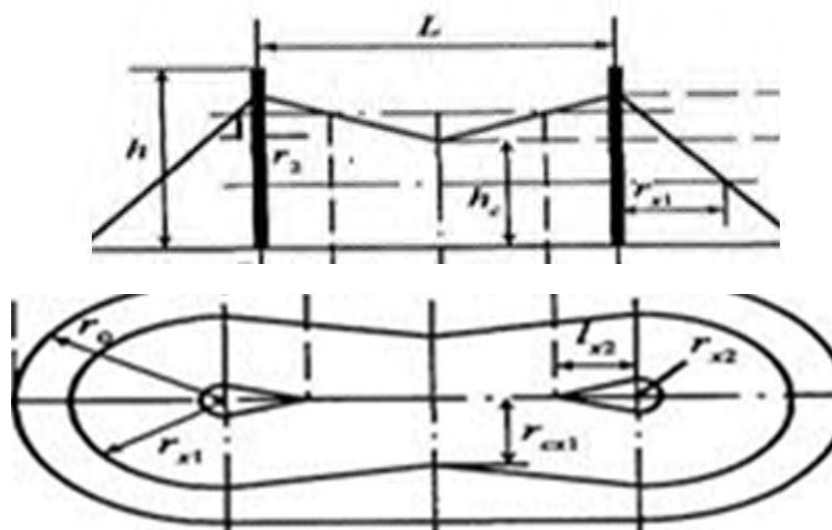


Fig. 1. Protection zone dual lightning rod

Included a distance limit L_{max} and L_c are calculated by empirical formulas, suitable for lightning conductors up to 150 m.

Thus, the calculated level of security to protect the stadium "Trud" will be 0.9 for lightning submitted lighting masts up to 30 meters[4].

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О разработке подхода к проведению сравнительной оценки альтернативных вариантов технических решений комплексного энергообеспечения объектов жилищно-коммунального хозяйства

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В современных условиях, когда Российское коммунальное хозяйство (энергоснабжение) остро нуждается в техническом перевооружении, а порой и полной замене систем энергоснабжения все большую роль приобретает привлечение капитала частных инвесторов. При этом желание последних вкладывать средства в дорогостоящие и долгосрочные проекты Российской энергетики напрямую зависят от ясного представления возможностей проекта к возврату капитала и получению прибыли.

Крупный бизнес при размещении промышленных, торгово-развлекательных и жилищных объектов все чаще обращает внимание на установки для децентрализованного энергоснабжения. Но, не смотря на то, что современные энергетические установки малой мощности становятся экономически конкурентными с системами централизованного энергоснабжения недостаток средств для получения точных результатов технико-экономической оценки их применимости сдерживает их широкое распространение.

В современной литературе размещено достаточное количество способов расчета эффективности работы отдельно взятых энергоустановок. Рынок услуг не испытывает дефицита в предложениях выполнить оценку экономической эффективности энергетических проектов. При этом применяемые способы нередко основаны на устаревших методиках, порой не утвержденных,