MININSTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL MINING UNIVERSITY

МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
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(PROGRAM OF REPORTS)
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In the case of coal fuels, as one of the main energy source, effective technologies for maintaining mining operations under difficult conditions are substantiated. The energy efficiency of coal gasification with the use of mining waste has been estimated, technical and technological means, as well as conditions for the introduction of the gas generator are proposed. In the aspect of the normalization of working conditions of miners, protective effectiveness of respiratory devices is established, taking into account the requirements of the European standard EN 529: 2006. The possibility of significant energy savings is demonstrated by the introduction of electric drives with group power from a conventional DC device with storage capacity.

Designed for researchers and practitioners, and can be useful for students, postgraduates, university lecturers, as well as for anyone, who interested in energy conservation issues.

Стосовно вугільного палива, як одного з основних енергоносіїв, обґрунтовано ефективні технології підтримки гірничих виробок у складних умовах вугільних шахт. Оцінено енергетичну ефективність газифікації вугілля при використанні відходів гірничого виробництва, запропоновано технічні й технологічні засоби та умови впровадження газогенераторів. В аспекті нормалізації умов роботи гірників визначено захисну ефективність респіраторних пристроїв з урахуванням вимог європейського стандарту EN 529:2006. Показано можливість значної економії енергії шляхом упровадження електроприводів з груповим живленням від звичайного обладнання постійного струму з ємністю зберігання, а також нормалізації традиційних індикаторів якості електроенергії.

Розраховано на наукових співробітників та практичних працівників і можуть бути корисними студентам, аспірантам, викладачам вищих навчальних закладів, а також усім, хто цікавиться проблемами енергозбереження.

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PREFACE

The Collection of scientific papers is prepared in the frame of International Scientific and Practical Conference "Energy Efficiency and Energy Saving, 2017" which was conducted as the event of the National Contact Point "Secure, Clean and Efficient Energy" under the support of the Ministry of Education and Science of Ukraine. This issue is dedicated to the 120th anniversary of the National Mining University (Dnipro, Ukraine). Solving technological, economical, social challenges in energy efficiency and saving are the necessary activity for the ensuring the fuel independence of Ukraine. Presented works together with scientific substantiation have practical proof of received results.

In the "Energy Strategy of Ukraine" coal is considered as one of the main energy sources. Experts estimate that, due to the gradual exhaustion of oil and gas in the twenty-first century, coal, as a fuel becomes the main energy source in the system "oil – natural gas – coal". Also, it has now been proven that the coal is the most investigated industrial resource of fuel resources that uses all leading countries of the world to provide sustainability to their national energy industries. The fact that coal is needed in Ukraine does not call any discussions.

From the point of view of the above, enough attention in this Collection is paid to the substantiation of energy-efficient technologies for supporting capital mining in the difficult conditions of the coal mines the Western Donbass. The proposed economic technologies to improve the stability of workings using a waste zones, which are filled by special mixtures by the pneumatic method. The development and the implementation of the mining equipment complexes in the new technical level is the way that should provide highly technological organization of mining works. The geomechanical task of estimating the acceptable parameters of the safe wallface support during the horizontal coal seam extraction is solved. For this purpose, was used numerous experiments on different digital models. The research has been carried out for extremal geological conditions of the mining.

However, coal mining is not the ending technological process. It is beneficial for the Ukrainian economy. So, its extraction should be continued and developed. But in many cases the coal extraction is not economically profitable, then no volitional solutions can prevent the inevitability of mines. Naturally, it is possible to slow down these processes for a while, but not exclude. Underground coal gasification is the technology, which can be used for effective output the unbalanced coal reserves. The Collection contains the description of the ecologically clean technology for the coal conversion to obtain an energy gasses, chemicals and heat.

The Collection is based on the results of the research presented in the scientific articles, it should be noted their novelty, high scientific level and practical utility. Proposed scientific-applied and methodical approaches to increase energy efficiency of the domestic industrial production and the direction of its further socio-ecological development. The presented results will promote the implementation of innovative solutions in the production processes and investment support of mining enterprises.

ПЕРЕДМОВА

Збірник наукових праць підготовлений у рамках Міжнародної науково-практичної конференції «Енергоефективність і енергозбереження 2017», яка була проведена як захід Національного контактного пункту програми ЄС Горизонт – 2020 «Безпечна, чиста й ефективна енергія» за підтримки МОН України. Його присвячено 120-річчю Національного гірничого університету (Дніпро, Україна). Розв'язання технологічних, економічних, соціальних проблем в області енергоефективності та економіки – необхідна складова забезпечення паливної незалежності України. Представлені роботи разом з науковим обґрунтуванням мають практичну реалізацію отриманих результатів.

При розробці Енергетичної стратегії України вугілля розглядалося як один з основних енергоносіїв. За оцінками експертів, у зв'язку з поступовим вичерпанням запасів нафти і газу, вугілля, як паливо, виступає на перший план і стає основним енергоносієм. Нині доведено, що вугілля – найбільш забезпечений розвіданими і промисловими запасами паливний ресурс, який використовують усі провідні країни світу для забезпечення стійкості національної енергетики.

З погляду на вищенаведене, у Збірнику достатньо уваги приділено обґрунтуванню енергоефективних технологій для підтримки капітальних гірничих виробок у складних умовах вугільних шахт Західного Донбасу. Запропоновано економічні технології підвищення стійкості виробок із використанням відпрацьованої зони, яка заповнюється закладною сумішшю пневматичним способом. Розв'язана геомеханічна задача оцінки припустимої ширини безпечної конструкції кріплення лави в процесі розробки горизонтального вугільного пласта. Із цією метою проведено й узагальнено чисельні експерименти на цифрових моделях. Дослідження виконані стосовно до складних геологічних і гірничотехнічних умов вугільних запасів на шахті.

Проте видобуток вугілля не є самоціллю. Якщо він економічно вигідний для держави, то видобування повинно продовжуватися і розвиватися. Якщо ні, то ніякі вольові рішення не здатні запобігти неминучості скорочення і згортання вуглевидобування. Природно, можна загальмувати або уповільнити ці процеси на деякий час, але не виключити. Компромісом між названими рішеннями на тепер виступає підземна газифікація вугільних пластів. У збірнику наведена екологічно чиста технологія перетворення шахтного газу для одержання енергетичного й хімічного газогенератора, хімікатів і тепла.

Виходячи із результатів досліджень, поданих у наукових працях, слід відзначити їх новизну, високий науковий рівень та практичну корисність. Запропоновано науково-прикладні й методичні підходи до підвищення енергоефективності вітчизняного промислового виробництва та напрями його подальшого соціально-екологічного розвитку, що сприятиме впровадженню інноваційних рішень у виробничі процеси та інвестиційному забезпеченню підприємств гірничодобувної галузі.

PLENARY SESSION

1. PROSPECTS FOR DEVELOPMENT OF WORLD COAL MINING AND THERMAL POWER GENERATION

PIVNYAK Gennadiy, SHASHENKO Olexandr & PASHKEVYCH Maryna

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The article deals with the problem of choosing a strategy for managing the coal industry and coal enterprises in the context of various economies of the world. The factors of the economic and ecological justification for either extension or termination of the coal enterprises' functioning are analyzed. A comparison of key indicators for energy generation based on coal combustion and the use of alternative energy sources is given. The concept of synchro-miningfor extending the life cycle of a coal mine in a market economy is proposed.

2. ENERGY EFFICIENCY AND ECONOMIC ASPECTS OF MINING WASTES UTILIZATION WITHIN THE CLOSED CYCLE OF UNDERGROUND GAS GENERATOR

PIVNYAK Gennadiy [1], DYCHKOVSKYI Roman[1],
FALSHTYNSKYI Volodymyr[1] & CABANA Edgar Cáceres[2]

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Energy efficiency of coal gasification with possible utilization of mining wastes within ecologically closed gas generator cycle has been considered. Technical and technological performance of such gas generator and mechanism of material and heat balance on the basis of the available analytical methods and practices as well as the developed author software have been proposed. Heat carrier formed in the process of coal gasification has been used for the utilization. Temperature of the utilization process within the industrially expedient limits being supported with the help of either activation or attenuation of the gasification process. After specific treatment, organogenic waste and domestic wastes are utilized by means of thermal decomposition within a gas generator. Economic evaluation of the proposed means confirms the expediency of their implementation in mines with industrial and balanced coal reserves as well as within the areas where this energetic source has already been already mined out. Results of this investigation were partially presented on international scientific and practical conference "Forum of Miners - 2017". They contain the researches, which were conducted within the project GP – 489, financed by Ministry of Education and Science of Ukraine.

3. ENVIRONMENTAL CLUSTER AS A POSSIBLE INSTRUMENT FOR THE PRODUCTION OF COMPETITIVENESS OF THE ENTERPRISE

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Reducing the cost of energy in the construction industry through energy conservation is possible through the introduction of innovative, integrated technologies, with the condition of taking into account the features of the operation of the environmental cluster. This approach is a powerful tool for raising the level of innovation and competitiveness of the national economy of Ukraine's economic systems, which will improve the standard of living of the whole population.

4. COMPETITIVE MARKET OF THERMAL ENERGY PRODUCTION IN UKRAINE

SHKARLET Serhiy & MARGASOVA Victoria

Chernihiv National Technological University, Chernihiv, Ukraine

It is shown that the creation of competitive conditions in the production of heat energy will allow attracting public and private investments in this sector of the central heat supply.The model of a competitive heat production market and its transportation to the end user will allow the emergence of "independent" producers and communal or private ownership of the production of this heat.This will provide an opportunity to update the infrastructure for the production of thermal energy, create additional and new jobs, which in turn will increase the flow to local budgets. Increase the efficiency of heat production and reduce heat tariffs for consumers and reduce gas consumption for alternative energy sources. The proposals on Ukraine's accession to the "Statute of the International Agency with Renewable Energy Sources IRENA" are considered.

The fate in this agency will allow; submit applications to the ADFD fund, get soft loans, get IRENA assistance in improving the regulatory framework, establish cooperation between Ukraine and developed countries, and get access to the IRENA databases on the latest technologies and developments. Most developed European countries have already created such a competitive market of thermal energy. Such solutions allow to improve the market of thermal energy production in our country. Also such expeirense is very important for other countries, which are planing to use this energy source.

5. ENERGY EFFECTIVENESS OF GEOTECHNICAL SYSTEMS

BESHTA Oleksandr

National Mining University, Dnipro, Ukraine

The trend of energy consumed growth all over the world demands to solve the problem of energy effectiveness of technological processes. Because of complexity of technological processes structure there is the main question to find a “worst link” in it. Effectiveness of technological process depends on type of process equipment and its links. There were formulated rules for choice most “weak” link of technological chain. Three strategic ways were learned for increasing of energy effectiveness: increasing productivity of the process equipment without increasing of its efficiency; increasing efficiency of the process equipment without increasing of its productivity; increasing both productivity and efficiency of the process equipment. Corresponding recommendations for growth of productivity or efficiency were given. There were proved that variation of average level of productivity of process equipment must be up to 50...60 % and the variation of productivity relative to the average in duty cycle of process equipment operation must not be more than 10 %.

The work contains the results of researches, with were contained under the project GP – 472, with was supported by Ministry of Science & Education of Ukraine.

6. SOME ASPECTS OF ENERGY EFFICIENT PROJECTMANAGEMENT

TREHUB Mykola, KRAVCHENKO Kostiantyn & TIUKHMENOVA Kseniia

National Mining University, Dnipro, Ukraine

According to energy-saving trends the use of all types of energy should be minimal and efficient. Since late 90-s such strategy has been already used in well-developed countries. In Ukraine the energy-saving measures became popular since 2014. Now it is possible to receive warm loans supported by Ukrainian government for private households and co-owners of multi-apartment buildings. Also, it is possible to apply for grants of the Ministry of Regional Development, Construction and Housing and Communal Services of Ukraine – the regional development projects that can be implemented at the expense of the state budget received from the European Union or other grants financed by local authorities at different levels. According to statistics it was found that using thermal sanitation method as a key measure of energy saving, it is possible to provide 85% of insulation efficiency. The research is focused on determination of weaknesses concerning grants for energy efficiency, their application and management. One of the most important factor that influence overall success is the correct calculation of energy losses. Three possible types of errors during calculations and possibilities to reduce their influencewere defined. At the end of the article conclusions and suggestions for further research were made.

DETERMINANTY ZUŻYCIA ENERGII, A WYSTARCZALNOŚĆ BAZY ZASOBOWEJ PALIW KOPALNYCH- ŚWIAT, POLSKA
(Report is presented in Polish language)

JERZY Kicki

AGH University of Science and Technology

Artykół prezentuje jeden z najważniejszych czynników decydujących o rozwoju naszej cywilizacji jakim jest energia i jej skala zużycia – dziś i w perspektywie kilkudziesięciu lat. Średnie zużycie energii na głowę mieszkańca ziemi stale rośnie i od początku rozwoju cywilizacji w niektórych krajach wzrosło ponad… 1000 razy. Dominujące źródła pozyskiwania energii to paliwa kopalne: węgiel, ropa naftowa i gaz ziemny. Wielki niepokój wzbudza fakt ich szybkiego sczerpywania i to iż są one nieodnawialne i … kiedyś się skończą. W roku 2014 ich udział był kluczowy dla bilansu energii w skali świata i wynosił 86 % przy czym udział węgla wynosił 30 %, gazu ziemnego – 24 %, ropy naftowej – 32 %. Kluczowe determinanty ich zużycia to: wzrost ludności świata, postęp gospodarczy, który stał się prawdziwą religią naszych czasów i zmiany klimatu, którymi od kilkunastu lat zaniepokojony jest świat.

Wzrost ludności świata postępuje w szalonym tempie o ile na osiągnięcie pierwszego miliarda mieszkańcy ziemi czekali ponad 1800 lat, a na kolejny ponad 100 lat, to miliardy ostatnie i najbliższe wymagają kilkunastu lat oczekiwania. Klimat się zmienia co odczuwamy wszyscy mieszkańcy ziemi. Ostatnie lata to najcieplejsze od początków pomiarów czyli od roku 1850. Wystąpienie prezentuje największych konsumentów energii na świecie, a tym samym tych którzy zużywają najwięcej paliw kopalnych jakimi są USA i Chiny. Jaka jest wystarczalność zatem zasobów kopalnych? Jaką politykę winien przyjąć świat aby wdrożyć zasadę zrównoważonego rozwoju czyli wzrostu postępu gospodarczego nie naruszającego stanu środowiska przyrodniczego i akceptowanego społecznie w imię troski o obecne i przyszłe pokolenia.

Wystąpienie odpowiada na te pytania bardzo generalnie wskazując kierunki działania jakimi są postęp techniczny i technologiczny oraz zmiany w podejściu do zużycia energii czyli np. ograniczenie wzrostu efektywności energetycznej traktowanej szczególnie przez Davida Yergina (The Quest – w poszukiwaniu energii – O energii, bezpieczeństwie i definiowaniu świata na nowo, wyd. polskie Kurhaus Publishing, 2013, wydanie amerykańskie 2012) laureata Nagrody Pulitzera jednego z największych pasjonatów, znawców energetyki światowej, który nazywa efektywność energetyczną „piątym paliwem”.

SECTION 1
ENERGY EFFICIENCY & ENERGY SAFETY (TECHNICAL & TECHNOLOGICAL ASPECTS)

1. METHOD OF CALCULATION OF SAFETY MINING PARAMETERS FOR OPENING DEEP HORIZONS OF OPENCAST MINES

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The current methods of calculation of safety mining parameters for opening deep horizons of opencast mines is described and analyzed. To determine correlations of safety mining parameters taking into account the terrain the calculation and analytical method are used. To add in method two new features: longitudinal and cross slopes of the terrain abstraction method is used. To justify analytical correlations modeling method and graph-analytical method are used. Correlations of finished trench volume and longitudinal and cross slopes of the terrain are determined. Method of calculation of safety mining parameters such as trench`s length and volume on deep horizon taking into account the terrain is adjusted. Influence of longitudinal and cross slopes of the terrain on safety mining length and volume is calculated. The recommendations for installation the trench on deep horizon of opencast mines taking into the terrain are given.

2. ON THE POSSIBILITY OF COALBED METHANE EXTRACTION AS A SOURCE OF ENERGY UNDER THE HYDRODYNAMIC IMPACT ON THE OUTBURST COAL SEAM

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In this article the possibility of methane gas extraction in coal deposits exploitation is considered. Experimental data on the application of hydrodynamic impact on a gas-saturated outburst coal seam prior to its baring in order to reduce gasdynamic activity due to an intensification of methane emission are presented. Also a structural and technological scheme of degassing pipelines that includes emergency protection and monitoring of coal mine methane parameters in real-time mode to ensure a safe, trouble-free process of its transportation to the cogeneration plant for further utilization is proposed.

3. COST REDUCTION AND CONTROL OF THE POTENTIALLY EXPLOSIVE ENVIRONMENT IN THE COAL MINING

ALEKSEYEV Mykhailo & GOLINKO Oleksandr

National Mining University, Dnipro, Ukraine

Validated method for automatic condition diagnostics of stationary analyzers of methane in a part of the automatic remote control of the zero readings of the analyzers by reducing the supply voltage of thermocouples to a value at which occurs the oxidation reaction of methane at the working thermocouple. It is shown that when using modern computer-based information processing is the ability to not only automatically test the stability of the zero readings of the analyzers, but also to adjust these readings when it changes, which can significantly reduce costs for maintenance and inspection of analyzers.

4. EFFICIENCY OF THE DEVELOPMENT OF IRON ORE PITS IN THE APPLICATION OF STEEP DIPPING LAYERS

ANISIMOV Oleg

National Mining University, Dnipro, Ukraine

Number of the benches, which form temporarily nonworking edges influences on number of the working plots at working out heavy pitching layers. Technological scheme of conducting works ground steep layers is promising for many deep pits where formed steep slopes temporarily closed pit's edges. The peak of the number of benches on the hanging side of the pit when working benches with a width of 60 m agree within mark of 300 m, and when working with benches a width of 40 m - at the level of 275 and 345 m.Formation edges' pit with sizeable angles of slope is an important task, as it allows largeness of overburden postpone to a later period of development of the field.The methods of research consist in the graphical construction of the pit edge, the analytical determination of number of the benches, and the analysis of the obtained results.

The working zone of the pit edge at working out by steep layers is studied. The dependence of effective work on different processes is shown. The advantages of the new technology are presented. The obtained results can be used in the designing of deep open pits.

5. CONTROL OF MINES ADAPTATION TO INFRASTRUCTURE OF COAL REGIONS

ASHCHEULOVA Oleksandra, MAMAIKIN Oleksandr & SALLI Serhii

National Mining University, Dnipro, Ukraine

The paper proposes technical approaches to reach a compromise between expediency of unprofitable enterprise subsidizing on the basis of production diversification potential and low-capacity mines construction within new sites.

To a great extent, Donbas loses its chance. For continuing (not to speak of developing) coal industry, extraordinary measures should be applied to support facilities mines having relatively favourable mining and geological conditions. Integrally, general policy of mine structure improvemet should be based on the necessity to mine effective reserves still limited in Ukraine. Those pseudooptimistic forecasts that coal reserves will be sufficient for hundreds years are wide open to criticism.

6. SOLUTIONS FOR FAST CHARGING STATIONS FOR ELECTRIC VEHICLES

BALAKHONTSEV Oleksandr & KHUDOLIY Serhii

National Mining University Dnipro, Ukraine

The paper deals with analysis of schematics of fast charging stations for electric vehicles. The commonly used power electronic converters are described and their operation is examined. The technical criteria for selecting proper schematic are proposed and recommendations for various conditions are given. Interaction of charging network with power utilities is considered, measures for providing electromagnetic compatibility are suggested.

7. AUTOMOBILE KINEMATICS IN SPACE

BAS Kostiantyn

National Transport University, Kyiv, Ukraine.

We present mathematical model of the vehicle motion in the earth coordinate system and the axes of the natural trihedron. We consider wheel vehicle as a material point under the conditions of non-uniform motion along a curved spatial line. We use hodograph in a class of spiral lines to describe the kinematics of a vehicle. We analyze the results of the study of the linear speed and the linear acceleration of the vehicle in space. The closed vector dependences are shown in the form of quaternion matrices providing efficient computational algorithms.

Work is conducted within the framework of “Improvement of technology of hybrid and purely electric vehicles and their integration into the power grid” research and development project GP-488. This project is financed by ministry of Education and Science of Ukraine

8. MODELING THE SYSTEM OF PROTECTION OF ELECTRICAL EQUIPMENT AGAINST EMERGENCY CONDITIONS

BAZHIN Hennadii & ULANOVA Nataliia
National Mining University, Dnipro, Ukraine

A mathematical model for the functioning of the protection system for electrical installations of the technological cycle is developed. The influence of the parameters of the system elements on the overall reliability of the protection functions is considered. a mathematical relationship between the parameters of emergency flows and the indicators of protective systems was obtained. The economical evaluation proves effectiveness of proposed technological solutions.

9. IDENTIFICATION OF THE EQUIVALENT CIRCUIT PARAMETERS OF SQUIRREL CAGE INDUCTION MOTOR WITH LOW SENSITIVITY TO THE ERRORS IN EXPERIMENTAL DATA

BESHTA Oleksandr & SIOMIN Andrii
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The method of active preliminary identification of the parameters of the T-shaped equivalent circuit of squirrel cage induction motor, which has low sensitivity to errors in the initial experimental data. Low sensitivity is obtained due to the use of the value of stator voltage frequency that depends on the motor’s power. It is proposed to carry out the identification procedure using unsymmetrical stator supply. It allows not to use load devices in experiments. The system of nonlinear equations is presented based on which the parameters of the equivalent circuit will be determined. The obtained results of the experimental verification of the method are the basis for recommending the developed method of active preliminary identification of parameters of the T-shaped equivalent circuit for practical use.

10. BUILDING ДЕВЕЛОПМЕНТ AS INALIENABLE CONSTITUENT OF DEVELOPMENT OF MARKET RELATIONS

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Modern going near organization of building development and complex building need the obligatory tying up of three basic constituents: geographical location of object (town-planning requirements and limitations related to placing of

object on concrete territory); having a special purpose setting of object and him optimal technical-economy indexes for an investor; features of engineering of territories (taking into account of powers of the infrastructural and transport systems, necessity of their development and modernization). Infrastructural development is the inalienable constituent of successful realization of modern building development, can be, by both the constituent of general project (projects) of development of territories, and distinguished in separate projects exceptionally of infrastructural direction.

11. INNOVATIVENESS of INVESTMENT TOOL BUILDING

BILYK Andrii & TESLENKO Pavlo

National university of building and architecture, Kyiv, Ukraine

Instrumentation as allows the instrument of preventive (belonging prejudicially) diagnostics of project to the customer of project and he is formalized investment partners to lead to financial-economy expediency of their participating in a project, educing - yet on the stage of initiation of project and him previous consideration are comparative advantages of project among other objects of investing. Instrumentation is sent also to diagnostician of possibility of internal environment of project to realize investment intention and strategy of model embodiment that will be realized in the format of temporal administrative "constrictive" of mobile temporal structure: from registration of investment intention - before completion of activity of temporal structure and introduction in an action of powers of object of investing.

12. IMPROVEMENT OF RELIABILITY OF SYNCHRONOUS DRIVES FOR POWERFUL AND POWER-INTENSIVE PRODUCTIONS

BORODAI Valerii & NESTEROVA Olha

National Mining University, Dnipro, Ukraine

Constant increase of energy resources costs encourages business to improve energy saving technologies. This includes use of electric drives for power-intensive productions, which are based on synchronous electric drive. High coefficient of performance, possibility of reactive power compensation are their main advantages. But the practice of their operation shows the disadvantages caused by unsecured start and impact loads followed by idle time and breakdowns. It is proposed to increase the reliability of energy-saving drive by means of equipping the motors with more modern excitation system with split excitation winding and active-reactive resistance and new control algorithm and feed.

The results of studies of improvement of starting qualities showed the possibility of reduction of set drive power for the mechanisms, which used motor

with redundant power supply of 25%. It should be noted that secured start for 15% reduced voltage is obtained in each case.

As for impact loads damping, the mathematic modeling for new method of excitation control was used. It was stated that it enables significant reduction of current oscillation of armature and thus reduction of costs of off-schedule capital repairs.

13. NVESTIGATION OF THE CLARIFICATION PROCESS USING LABORATORY PLATE

CHECHEL Taras

National Mining University, Dnipro, Ukraine

The paper presents and describes the thickener scheme for clarification process of recycled water. The design of the plant for necessary technological process which is designed to close the water slurry schemes of mining enterprises and to maintain the optimal level of solid component in circulating water is analyzed. Directions of particle motion velocities along inclined plates are justified.

14. ON THE PROBLEM OF FILTER RESPIRATOR SELECTION

CHEBERIACHKO Ivan, CHEBERIACHKO Yuriy & YAVORSKYI Andrii

National Mining University, Dnipro, Ukraine

Requirements concerning the selection of filtering respirators according to EN 529:2006 European standard have been analyzed; the requirements have been compared with the national recommendations given in the corresponding DNAOP 0.00-1.04-07 normative act on labour protection. It has been determined that the protective efficiency of the respiratory protective devices is characterized by three various parameters characterizing the coefficient of protection – two of them are determined at the working place. However, adequate selection of a filtering respirator is tested in terms of nominal coefficient of protection being determined in a laboratory. Such an approach may result in certain errors due to the set of various factors being available under working conditions. It is proposed to use the value of the expected coefficient of protection determined in the USA being equal to 10 MAC while selecting a filtering respirator. Recommendations are given as for the improvement of respiratory protection of a worker under operational conditions.

15. PROTECTIVE EFFICIENCY OF FILTERING RESPIRATORS

CHEBERIACHKO Sergiy, YAVORS'KA Olena,
STOLBCHENKO Olena & RADCHUK Dmytro

National Mining University, Dnipro, Ukraine

In the article was established the dependence of protective effectiveness of the respiratory protective devices on the filters penetration coefficient and leakage of the polluted air through sealing band. The leakage was determined by the ratio of the filter resistance and the sealing band. Was established the relationship between increasing of the filter resistance and worsening the protective effectiveness of respiratory protective device. Determined factors that worsen the respirators quality: the gaps presence between the face and half-mask, weak tension of the head harness. Was established the filter parameters that will ensure high efficiency for respirators of the second protection class.

16. MINING AND PROCESSING ENTERPRISES

CHEREP Andrii & PILOVA Dar'ya

National Mining University, Dnipro, Ukraine

The significant reduction in the volume of production of concentrate at the Ordzhonikidzevsky mining and processing enterprise, which led to an increase in the cost of manganese ore and concentrate due to the increase in specific conditional-fixed costs for mining of overburden rocks by the bucket wheel complexes is analyzed. The dependencies between the cost of ore and concentrate on the volume of ore production and concentrate production are determined. As a result of the unevenness of production volumes and the unevenness of the volumes of shipment of production that do not coincide with each other, is substantiated that the mining and processing enterprise has to block certain amounts of funds, which leads to increased production costs.

17. THE FEATURES OF METHODOLOGY FOR PREDICTING LIMESTONE DRESSING EFFICIENCY

DRESHPAK Oleksandr

National Mining University, Dnipro, Ukraine

Methodology for predicting efficiency of dressing raw materials, taken from heterogeneous carbonatedeposit, is proposed. The methodology, based on the results of gluometric and chemical analysis, applies regression models that present table data of experimental studies by means of stochastic dependences. The methodologyimplies building dependences between energy efficiency indicators and

boundary productivity of particles separation, screening efficiency, as well as determining energy-efficient modes.

18. ENERGY-SAVING TECHNOLOGIES FOR DISMANTLING CONNECTIONS OF MACHINE PARTS THAT ARE MADE WITH INTERFERENCE FIT

DRESHPAK Natalia

National Mining University, Dnipro, Ukraine

The features of induction heating of machine parts connections, made with interference fit, are described. Induction heating provides the connections dismantling which is characterized with low energy consumption. This is caused by short heating time and limited amount of the heated products. Specific heating power, which guarantees conditions to resize dismantling, is defined. Mathematical model, for investigating thermal processes, is created.

19. ACTIVATED CARBON AS A MEAN OF IMPROVING THE ELECTRODE EFFICIENCY FOR ELECTROCHEMICAL POWER SOURCES

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DUPLIAK Ivan

Lviv Polytechnic National University, Lviv, Ukraine

Scientific dependences, which specify pseudocapacity on the fractional surface coverage of bromine on the nanoporous activated carbon materials ware built. Using data of galvanostatic charge-discharge at different densities and parameters of specific pseudocapacity on the fractional surface coverage were received. The comparison of theoretical and experimental dependences shows that the investigated process is the process of electrosorption according to Frumkin model with stable parameterof interatomic interactions in adsorption layer. The Ragone depending of the electrode in the system of electrochemical energy source was studied. The obtained experimental values is equal to nearly 85 % of the theoretical ones.

The obtained high values of specific power, energy, capacity and electrode performance based on commercial activated carbon materials can be considered as a promising positive electrode for electrochemical energy source. Economical avaluation shows the effectiveness of proposed technological improvement and its industrial implementation.

20. ECONOMIC ASPECTS OF A SMALL AREA HOUSING AND THEIR CHANGES IN THE OPERATION PROCESS

DUPLIAK Maria & SEMENOV Andrii

National Mining University, Dnipro, Ukraine

The analysis of available solutions and historical aspects of creation of individual dwelling houses in Ukraine is carried out. The issue of saving and economical use of residential space has become particularly relevant in the modern design of such buildings. Modern building technologies allow us to come up with a new approach to designing a modern Ukrainian house using historical traditions. An example of a modern regionally oriented Ukrainian village considered the expediency of designing an individual one-family residential building of a small area. The work is aimed at creating the appropriate location of residential and technological premises in the building with the purpose of applying new economically attractive building materials and the formation of a heating system with the use of energy-saving technologies for their heating based on the territorial location and security of energy raw materials.

The work contains the results of researches, with were contained under the project GP – 489, with was supported by Ministry of Science & Education of Ukraine.

21. DEVELOPMENT TECHNOGENIC DEPOSITS BY THE TECHNOLOGY PRODUCTION OF COMPOSITE FUEL

GAJDAJ Oleksandr & RUSKYH Vladyslav

National Mining University, Dnipro, Ukraine

Deposits that are formed as a result of human industrial activities (further technogenic ones) and are represented by storage of coal slimes and shaibas, ash and slag, sawdust, paper and metallurgical production waste occupy huge areas, which leads to alienation of agricultural lands and a tangible deterioration of the ecological situation in the territories. But the quantity of useful combustible components, in such repositories, is about 20-90%, which can be used as a solid fuel. In this case, the current industrial and social problem of consumption in additional solid fuels is being solved and the ecological load of the regions where underground mining of coal deposits is being maintained is reduced, as well as the burning of coal in thermal power plants and other industrial facilities.

As an effective method of obtaining energy-efficient resources and bringing them to technical requirements, an adhesion-chemical technology is proposed for the development of technogenic mineral deposits.

The technology and technical conditions for the production of organic fuel have been developed. The technology is based on adhesion-chemical processes of

interaction of parts of composite fuel, which is formed into briquettes, with the help of the OT-31M installation. Agglomerated cylindrical fuel rods of a certain shape (20 – 70 mm) obtained during the pressing process (under pressure of 1,2 – 2,0 MPa).

Fuel, even when using high-ash coal-bearing slurries, has a calorific value of at least 3500 kcal / kg, and when agglomerating low-ash coal it can reach 4,500 kcal / kg, with agglomeration of anthracite sludges and scabs - up to 6,000 kcal / kg.

The use of composite fuel, obtained with the installation of XOT-31M: heating of premises for household appliances; burning in local boiler houses; use in drying ovens; heating of trains on the railway; heating of greenhouses and greenhouses; burning in the Kuznetsk highlands; use in thermal power plants and other facilities.

The work contains the results of researches, with were contained under the project GP – 482, with was supported by Ministry of Science & Education of Ukraine.

22. OPTIMIZATION OF APPLICATION OF TECHNOLOGICAL SCHEMES OF CARRIAGE OF THE ROCK MASS TO ENERGY EXPENDITURES AT THE DEVELOPMENT OF GRANITE DEPOSITS

CHERNIAIEV Oleksii

National Mining University, Dnipro, Ukraine

Thedependence of the distance and specific energy intensity of transportation from the depth of development are established. The obtained results will allow choosing the optimal transport scheme for typical quarries. The optimal scheme of transportation of rock mass on granite and stone quarries of Ukraine, with the use of conveyor and automobile types of delivery are justified. The dependence of the distance and specific energy intensity of transportation on the depth of development of typical quarries, which determine the conditions for the application of technological schemes, are established.

To obtain the results, the following methods were used: statistical - for a review of the technology used in the existing non-metallic open-cast mines in Ukraine for the extraction of raw materials for crushed stone production, analytical - to establish the dependence of the specific energy intensity of transportation of rock mass. The established dependences of the specific energy consumption of transportation the rock mass allow optimizing the choice of the type of transport for a particular type of quarries, taking into account the use of modern imported equipment.

The research was carried out within the framework of the thesis on the topic "Optimization of the depth of development of non-metallic deposits of rock minerals with internal storage of waste rocks".

23. MODEL OF ONE-ZONE DIRECT-CURRENT ELECTRIC DRIVE WITH ELASTIC COUPLING

HOROBETS Viacheslav

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The elastic mechanical links of the drive of machines, as energy accumulators, cause oscillations of its coordinates with deviation of processes from those specified by technology and the growth of loads on the transmissions and the electric motor. Dynamic loads of an oscillating nature do not allow the use of electrical equipment for overload capacity, significantly reduce the service life of node and components of mechanical transmission for wear resistance and endurance. One of the priority direction of active elimination of elastic mechanical oscillations is the synthesis of electromechanical systems with the realization of the damping action of the electric drive.

The following issues were resolved: calculation of regulators parameters, correcting and feedback of the electric drive; analysis of the influence of elastic coupling on the circuitcurrent and circuit speed in a one-zone dual-circuit direct current electric drive; adjustment of the speed contour of a one-zone electric drive with a system of subordinate regulation of parameters, taking into account the elastic coupling; synthesis and analysis of methods for correcting the system of subordinate regulation, taking into account the elasticity in the mechanical transmission.

As an example for model was used the DC motor type P101 with the following parameters: rated voltage; rated current; rated speed; resistance of the anchor circuit; moment of inertia. With the motor was used thyristor converter (TC) with constant. The overload capacity of motor. Value moments of inertia. Attenuating oscillation frequency system. The preferred ratio of moments of inertia. Regulatorcurrent – proportional-integral (PI). Regulator speed – proportional (P) EMF is uncompensated.

24. JUSTIFICATION OF REASONABLE COSTS OF SECURITY MEASURES WHEN DESIGNING NEW ENERGY-EFFICIENT TECHNOLOGIES

GOLINKO Vasyl

National mining University, Dnipro, Ukraine

It is shown that the determination of the appropriate level of spending on security measures in the development of new energy efficient technologies and equipment is reduced to the search option, which provides the minimum total cost values for equipment, and possible losses due to possible hazardous events. In the classical form is reduced to the solution of the optimization problem of finding the

minimum of the functional is the sum of the costs of implementation and potential losses resulting from hazardous events in the limits imposed by the need to comply with the requirements of normative-legal acts on labor protection.

25. ANALYSIS OF SOLAR COLLECTORS EFFICIENCY IN THE DNIPROPETROVSK REGION.

GREBENIUK Andrii

National Mining University, Dnipro, Ukraine

The analysis of solar insolation in the Dnipropetrovsk region is carried out considering the scattered solar radiation, that enters the earth's surface and on the roofs of buildings depending on the height of the structures and the location above sea level. The possibility of using solar collectors of various types is considered taking into account the analysis of solar insolation, their advantages and disadvantages depending various connection schemes.

26. EVALUATION OF SOLAR POWER PLANTS EFFICIENCY FOR ENTERPRISES' ENERGY CONSUMPTION PEAKS COMPENSATION

HREBONKINA Dariya

National Mining University, Dnipro, Ukraine

The formation of electricity tariffs was studied and described. The existing types of enterprises were analyzed based on type of energy consumption over time. Several enterprises categories with sharply different types of energy consumption were selected, and typical electric load graphs are provided for each category. Having analyzed the power consumption cycles nature and duration for each enterprise, a solution for energy consumption peaks compensation with solar power plant is offered.

27. THE RESONANCE INITIATION IN THE STEEL HEADFRAMES FROM THE TECHNOGENIC SEISMICITY

IVANOVA Anna, CHUMAK Oleksandr & FESKOVA Liudmyla

National Mining University, Dnipro, Ukraine

In the work the problem of complicating engineering structures and structures is raised, which in turn increases their vulnerability to natural phenomena. Each structure has some probability of destruction, an attempt to bring this probability to zero is accompanied by a rapid increase in its value. In addition, structures cannot be completely free from the risk of destruction due to uncertainties in the requirements for the system, the spread of the technical properties of building materials, the

difficulties in adequately modeling the behavior of the system even with the use of modern software systems. The need to take into account the frequency composition of technogenic earthquakes which will allow to perform the necessary protection of structures that are particularly long-lasting from the resonance effect is considered and justified.

28. ASPECTS OF THE USE OF ELECTRO-CHEMICAL POWER STORAGE DEVICES IN POWER SUPPLY SYSTEMS

KHATSKEVYCH Yuliya

National Mining University, Dnipro, Ukraine

The necessity to use power storage in the modern power supply systems is caused by the significant unpredictable changes in power generation and by the growing need of load management. The electro-chemical storage devices such as lithium-ion batteries is one of the possible solutions of the problem. The modes of operation, ageing, control and other aspects of the storage devices use are analyzed in the report. A conclusion about objectives of further research in the field is given.

29. ENERGY-SAVING TECHNOLOGIES OF THE COAL SEAMS DEVELOPMENT

KHOZIAIKINA Nataliia & CHEREDNYK Vladyslava

National Mining University, Dnipro, Ukraine

In the production cost structure of a coal, which is extracted underground, more than 30 percent is the electricity cost. This is the consumption of electricity by the main fans of mine ventilation, mining and mechanisms that are used in the construction of underground excavations.

The geomechanicalproblem of estimating the permissible width of the safety structure (pillar) in a longwall during the mining of a horizontal laying coal seam is given and solved and taking into account the economic expediency of reused a haulage drift. The mining-geological and mining-technical conditions of coal reserves mining in the Western Donbass at the mine "Samarskaya" are considered, which is accepted as a characteristic object of research.

The task was solved in a complex way on the basis of a generalization ofin situ and numerical experiments on digital models using the RS2 software complex of the Canadian company Rocscience.

Dependencies of a residual sectional area of the re-used excavation on the width and the constructive flexibility of the protective structure are obtained.

A technological clearance between the safety structure and the roof rock negatively effects on excavation stability reducing the residual sectional area and should be minimized.

30. THE SEARCH FOR WAYS TO INCREASE THE PRODUCTIVITY OF MINE LOCOMOTIVE TRANSPORT

KIBA Viacheslav

National Mining University, Dnipro, Ukraine

The analysis of possibility to increase the work stability of the transport chain in underground conditions of mine is conducted. Due to poor condition of the track (poor balancing, lack of control of both the rails being parallel and their width change), the wheel flange wears out and the mine car can come off the track. Constructive and technological methods for solving the problem are recommended. The practical implementation of research results is presented. The economic evaluation is performed for experimental patterns and their effectiveness is proven.

31. SEMICONDUCTORCOMPENSATORS CONTROL OF FULL POWER INACTIVE COMPONENTS

KOLB Andrii

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Continuous growth of the installed power of controlled rectifiers (drives of rolling mills), AC regulators and frequency converters for a regulated AC drive, as well as non-linear consumers (arc steel smelting furnaces) significantly exacerbated the problem of ensuring the required quality of electricity. Traditionally, the solution of this problem is realized using controlled passive reactive elements and filter compensating devices with known drawbacks. The article proposes a relay-vector control principle for a gate compensator based on AVI with PWM using generalized spatial vectors of voltage and current. This makes it easier to isolate and continuously monitor the inactive components of the currents to be compensated. The use of these components allows controlling the reactive power, minimizing the higher harmonics, compensating for the power of asymmetry, and simultaneously compensating for all inactive components of power.

32. ANALYSIS OF VARIOUS METHODS OF CLOSED-LOOP SYSTEMS DISCRETIZATION FOR MODELING AND IDENTIFICATION

KOLB Anton

National Mining University, Dnipro, Ukraine

Difference equations obtained based on discrete transfer functions are an effective numerical-analytical method of modeling and identification of an automated electric drive. For this it is necessary to go from the continuous W (S) to the discrete W (Z) transfer function of the system. Afterwards to the difference equation, by

means of which the program algorithm for modeling or identification is compiled. Operational modeling methods are less complex, which allows to simulate and identify actuators in real time. The article analyzes various methods of discretization of closed systems for simulation and identification tasks. It is established that for the purposes of modeling and identification of parameters, the Z-form method, providing an error of not more than 1%, is the most convenient and accurate of the known discretization methods for continuous systems.

33. THE INFLUENCE OF A TURN OF THE VESSEL ON THE STRESS FIELD IN A FLAT ROPE OF A MINE HOIST

KOLOSOV Dmytro & NAUMENKO Olena

National Mining University, Dnipro, Ukraine

Analytical dependencies for determining the stress-strain state of the flat head rope of a mine hoist, taking into account variations of geometrical parameters of the shaft reinforcement from the design values are obtained. The method of research is an analytical solution of equations describing the stress-strain state of a layered structure. The originality is in establishing previously unknown mathematical dependencies of a stress-strain state of the flat head rope of a mine hoist. The results have to be taken into account when analyzing the admissibility of safe hoisting of raw materials in the mine shafts with impaired arrangement of the hoisting vessel guides. A comprehensive account of the impact of various factors on the stress-strain state of the rope allows determining the loss of tractive capacity in operation on the hoisting engine.

This article contains the results of a research on the project GP-495, funded by the Ministry of Education and Science of Ukraine.

34. ANALYSIS OF THE STRESS-STRAIN STATE OF THE TUBULAR RUBBERIZED ROPE WITH CABLE BREAKAGE

KOLOSOV Dmytro & ONYSHCHENKO Serhii

National Mining University, Dnipro, Ukraine

The main feature of a winding engine for underwater mineral resources extraction is the area near a drum in which a flat rope gets tubular shape. The flat rope is deformed, acquiring additional stresses. The values of such stresses affect engine operation safety so they have to be taken into account in its design. Analytical dependencies for a rubberized rope of tubular shape are obtained to determine the maximum values of internal tensile forces in cables and the distributed tangential forces in the layers of rubber induced by breaking of any cable, including cable of the lock. The equations produced may be used in engineering and design of winding engines with tubular pulling device. The performed study makes it possible to apply

rubberized ropes in underwater mineral resources extraction in deep waters, improving environmental safety of mining operations.

This article contains the results of a research on the project GP-485, funded by the Ministry of Education and Science of Ukraine.

35. NEW CLASSIFICATION OF ORE DEPOSITS MINING METHODS

KONONENKO Maksym, KHOMENKO Oleh & ASTAFIEV Denys

National Mining University, Dnipro, Ukraine

The analysis of advantages and disadvantages of the existing classifications of mining method by the way of stoping space supporting in the course of extraction of ores is executed. The new classification of mining methods of ore deposits allowing to capture all range of the applied variants of systems for different mining-and-geological and mining conditions is developed. It is possible to formulate names of mining methods on proposed which allows to present a complex of the productions which are carried out during mining of production blocks.

36. ENERGY MODERNISATION OF BUILDINGS AND HIDDEN DANGERS

KOSHELENKO Ievginii

National Mining University, Dnipro, Ukraine

The results of the energy survey of multistage buildings in Dnipro are described. The main attention is paid to the loss of thermal energy through the enclosing structures and through the heat pipelines. The necessity of conducting a full energy survey of buildings before their modernization is substantiated, because some structures have structural disturbances, such as cracking of panel seams and wall stratification. Creation of thermal modernization of these structures not only does not provide the expected savings, but also represents a danger associated with the possibility of crash of a new thermal insulation in the further exploitation of the building.

37. DYNAMICS OF NO-LOAD LOSSES IN POWER TRANSFORMERS

KRASOVSKYI Pavlo

National Mining University, Dnipro, Ukraine

Developed and released recommendations to clarify the calculation of idle power losses in power transformers of distribution networks. It takes into account the dynamics of magnetic properties changes in transformer cores, depending on the

operation term and conditions, andmajor overhaul of the transformers with the magnetic core unburdening. It will improve the accuracy of normative losses calculation in power transformers and determine the most accurate structure of losses in electric networks.

38. AUTOMATED SYSTEM FOR EFFICIENT DECISION MAKING COAL ENTERPRISES

KOZYR Svitlana

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The simulation model for a system of preview and effective justifications that will improve the ability to perform scheduled load on a cleans laughter 31% when compared with the actual state of implementation of planned indexes according to the decisions of the managing staff in hierarchical management system of mining enterprises was created. The system of making effective management solutions on the basis of the forecast, obtained hanks to the modern simulation model adapted to the specific conditions of individual mining production was developed.

As the method of research was used structural analysis of processes of cutting loader coal extraction in facewall to determine the duration and performance of individual technological operations, as well as used simulation to predict the daily output depending on the real state of the mechanized equipment in the coal mining. According on mentioned statements was proposed automated system making effective management solutions unlike the well-known based on modern unique expert data particular mining enterprise.

Using the developed simulation models the process of extracting coal allows to: objectively evaluate indicators of daily output, depending on the real state of the mechanized equipment coal mining; timelyad just the number of spare parts of coal equipment and its repairs that substantially can reduce unscheduled downtime of technological equipment and as a consequence will increase the productivity of the coal mining; by reducing the number of persons receiving a decision in the chain of decision-making and clear division of the responsibility between them decreases the number of bug sand improves the manageability of the mining enterprise.

39. INSULATION PARAMETERS MONITORING IN MEDIUM VOLTAGE NETWORKS

KYRYCHENKO Maryna

National Mining University, Dnipro, Ukraine

The causes of damage in medium voltage networks are considered. The main methods used to monitor the insulationcondition and to detect the fault location are described. The structure of the system for continuous monitoring of insulation

parameters in medium voltage networks based on signal injection is presented. A functional scheme of a system for continuous monitoring of insulation parameters is given. A technique for the current insulation parameters monitoring (capacitance and resistance) is described.

40. USE OF INNOVATIVE TECHNOLOGIES FOR THE SAKE OF COST CUTTING FOR ENTERPRISE

IAKYMCHUK Iryna & DEMOCHANI Olena

National University of Building and Architecture, Kyiv, Ukraine

Control system by the charges of any enterprise includes the subsystems of search of factors of economy of resources and their setting of norms, planning, account, analysis, their stimulation and decline. The receipt of maximal income from the activity enterprises constantly to search factors and backlogs of decline of made unit cost. In a government a production and other business processes base, for making decision within the framework of industrial and economic activity of enterprise, at the cutback of spending on the production of that or other type of products a choice lies based on a concrete situation. The main task of management to forming of charges of production is determination of their reasonable size with the aim of control, and also increase of income and level of profitability.

41. THE FIRST APPROXIMATION OF THE EIGENVALUES EQUATIONS OF OSCILLATIONS OF A ROUND AND RECTANGULAR PLATE

LAHOSHNA Olena & MATYSINA Nataliia

National Mining University, Dnipro, Ukraine.

The first approximations of the eigenvalues of the pinched and hinged supported circular and rectangular plates are determined for a given perturbation of the boundary. Simple rectangular expressions are obtained for a rectangular plate. The solution of the degenerate eigenvalue problem for a clamped rectangular plate, which enters into the expression determining the first approximation of the eigenvalue of the original problem, is found by V. Bolotin's asymptotic method. Specific examples of the pinched and hinged supported circular and rectangular plates are considered.

42. ASYMPTOTICS OF EIGENVALUES AND EIGENFUNCTIONS OF THE EQUATION OF OSCILLATIONS OF CRUSHING AND A HINGED PLATE AT A SMALL PERTURBATION OF THE BOUNDARY

LAGOSHNY Alexander & LAHOSHNA Olena

National Mining University, Dnipro, Ukraine

Built the iterative process of determining the terms of the asymptotic problems of oscillations of a clamped and simply supported uniform plate with a small perturbation of the boundary in the case of simple and multiple eigenvalues. The iterative process is constructed directly without conversion from perturbed to unperturbed region. Otherwise the coefficients of the transformed equation would depend on the conversion, making the study of the asymptotic behavior inconvenient. It is assumed that the unperturbed contour piecewise smooth. The problem of the hinged support additionally assumed that the contour not have inflection points. Specified limit satisfies a fairly wide class of contours. The first perturbation of the eigenvalues of the problems under consideration are linear functionals of the function that defines the boundaries of indignation. These ratios are suitable for practical use.

43. DYNAMIC REGIONAL EFFECT IS IN BARS

LAHOSHNA Olena & MATYSINA Nataliia

National Mining University, Dnipro, Ukraine

The asymptotic conduct of own numbers and own functions of equalization of forms of oscillation of bar is studied in the article. As model (as illustration of method of exception) the task of determination of asimtotic of eigenfrequencies and forms of vibrations of homogeneous bar is examined from different family by regional terms at large own values. An initial task is examined as a task with a small parameter ε, related to the large own value $\lambda 2$, $\varepsilon=\lambda-1/2,\lambda\to\infty$. A «maximum» (shortened) task is formulated on own values for equalization of forms of vibrations of string. The feature of such raising is that a «maximum» task, in this case, in same queue, depends on a small parameter.

The decision of the shortened task equates with the close decision of initial task (by the value of eigenfrequencies and expression for oscillating parts of forms of vibrations), by the got asymptotic method V.V. Bolotina. Regional «maximum» problem specifications are determined the method of exception, as, by virtue of identical changeableness oscillating part of decision and regional effects abstrusely, what from scope initial problem specifications it is necessary to cast aside.

The proper asymptotic estimations are resulted. Thus, the closeness of decisions (rationed own functions and own values) of initial and shortened tasks is set

at $\lambda \to \infty$, that allows to realize an asymptotic method Bolotina in unidimensional case.

44. DIFFERENTIAL SYSTEM OF THE ROPE ANCHORS LOADING DURING EXTRACTION DRIFT SUPPORT

LAPKO Viktor, FOMYCHOV Vadym, POCHEPOV Viktor & FOMYCHOVA Liudmyla

National Mining University, Dnipro, Ukraine

The main purpose of computational experiment was to evaluate the effect of rope anchor pre-tensioning on the rocks of roof stability of mine working reuse for different geological conditions. Computations have allowed receiving dependence of rope anchor stress state in time, before and after the working face passage through the plane of the modeling anchors. The obtained results have allowed developing optimal differential conditions of rope anchor loading, depending on the strength characteristics of the rock layer that forms the rocks of roof above the mine working. Pre-tensioning force of rope anchor determines the qualitative and quantitative development of deformations in the marginal rock massif. Selection of the optimal value of the anchor tension depends from rheological properties of rocks of roof above excavation drift. Differentiated system of rope anchor loading can improve the stable stability of the excavation drift by optimizing the distribution of non-linear deformation occurs in the rocks forming roof of a drift. The results of computational experiments require verification in natural conditions. Necessary to carry out measurements of displacements at the roof of the drift fixed at the experimental site of the rope anchor with different pre-tensioning forces. Thus, our research will finally confirm the effectiveness of the system of differentiated load of anchor support combined into a single load-carrying system.

45. ANALYSIS OF LOSSES OF ELECTRIC ENERGY WITH NON-SINUSOIDAL VOLTAGE

LYSENKO Oleksandra

National Mining University, Dnipro, Ukraine

Higher harmonics in electric power supply systems have negative effect on technical state of electric facilities impairing economic parameters of their performance. This is the reason for extra loss in energy which worsens thermal conditions of electric equipment complicating reactive power compensation with the help of static capacitor banks. This fact shortens the life of electric machines and apparatus due to accelerated ageing of insulation; in addition, errors of networking and system automatic facilities as well as remote control equipment take place. Analysis of additional losses with non-sinusoidal voltage showed a direct relationship

between the level of losses and the operating mode of individual electrical installations.

46. UTILIZATION OF MINE GAS AND ITS TRANSPORTATION IN A SOLID STATE

LYSENKO Roman & HANUSHEVYCH Kostyantyn

National Mining University, Dnipro Ukraine

Storage and transportation of natural gas in the form of hydrates is currently considered as an alternative to storage and transportation technologies for liquefied and compressed gas. According to the available estimates, for the development of gas-coal deposits, small and medium-sized gas reserves, the hydrate technology for storing and transporting natural gas is economically more profitable and contains a number of technological advantages primarily on energy costs. In such deposits are about 80% of the world's natural gas reserves.

Coalbed methane presents a huge potential both for industry and for people since it can be successfully converted into a solid gas hydrate state with further transportation by an on road vehicle. Gas hydrate technology allows increasing safety during transportation and decrease its expenses. Moreover, there is no need to build high liquid gas terminals since the gas recovered from the mine is instantly converted into a solid state in situ.

The work contains results of researches on the project GP-473, which is financed by Ministry of Sciences and Education of Ukraine.

47. UNDERGROUND COAL GASIFICATION EFFICIENCY IN AREAS OF HIGH FAULTING FREQUENCY

LOZYNSKYI Vasyl

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The purpose of this paper is substantiating of efficiency during application of borehole underground coal gasification technology based on target coal seam geology. Comprehensive methodology that included analytical calculation is implemented in the work. To determine the efficiency of coal seam gasification in faulting areas, an economic calculation method was developed. The obtained conditions of coal seam allow to provide rational order of mine workings. Conclusions regarding the implementation of the offered method are made on the basis of undertaken investigations. The obtained results with sufficient accuracy in practical application will allow consume coal reserves in the faulting zones using environmentally friendly conversion technology to obtain power and chemical generator gas, chemicals and heat.

48. SOME ASPECTS OF POWER SUBSTINATION OF TRANSFORMERS

LUTSENKO Ivan

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Transformers 110 (150) kV of power substations are one of the main parts of the distribution grid, and the effectiveness of their operating modes is directly related to the life service which significantly depends on electric loads. In this work the analysis and the actual use of transformer equipment in electric networks according to loading ability are determined, as well as measures for optimization of their operating modes and increase of loading rates are developed and grounded. It is proved that the use of power transformers over regulated service life is inappropriate due to significant underloads and high energy losses. The algorithm of power transformer operation mode efficiency analysis is developed, as well as the criteria and recommendations for its changing or transformer's replacement are grounded. Expressions for the appropriate loading factors determination for multi-transformer substations in normal and post-failure modes are proposed. For the current state transformers loading ability use, in most cases it is impractical to carry out capital expendituresfor underloaded equipment, and it is necessary to install new adequate sizes for actual load.

49. THE PROBLEMS OF OPERATION SCHEDULE RELIABILITY IMPROVEMENT IN MINES

MAMAIKIN Oleksandr, SALLI Serhii & DEMCHENKO Yurii

National Mining University, Dnipro, Ukraine

At the article represents idea to determine technological reliability of a mine. It include economic criterion to evaluate reliability of operation schedules of mines, which depend on management methods of reliability of certain mine subsystems. Principle one means use of improved that is more capital intensive mining equipment, transport systems etc. Principle two is component redundancy.

The greatest reserves for productivity enhancement of mines (together with their resource potential management) is in focused control of operational reliability of certain technological segments to increase extent of production through decrease in breakdown of machines and mechanisms as well as implementation of target investment system for components basing upon "Investment-reliability" approach.

50. THE SELECTION OF THE OPTIMUM PV MODULES/INVERTER POWER FACTORFOR SMALL GRID-CONNECTED SOLAR POWER STATIONS.

MERZLIKIN Andrii[1], AKULOV Artem[2] & HREBENIUK Andrii[2,]

[1]LLC "M&A Group", Dnipro, Ukraine
[2]National Mining University, Dnipro, Ukraine

The aim of this research is to find out the PV modules/inverterpower ratio, that will result into maximum of solar power station yield. The simulation model with different power factor parameters was carried out. The result of the modeling shows that the optimal power factor for small solar power plant in Ukraine is between 1.15 and 1.2.

51. INTERHARMONICS IN POWER SUPPLY SYSTEMS

PAPAIKA Yurii

National Mining University, Dnipro, Ukraine

The issue of power quality is still one of the critical components of a more general problem of energy efficiency which significantly defines the present state of power engineering. Interharmonics - poorly understood question in power supply systems. The Interharmonics sources are consumers working constantly or temporarily in the transient mode. This mode is conditioned either by the load change associated with the technological processes mode, or by peculiarities of the electromagnetic processes, accompanying operation of electrical appliances, e.g. half-duplex operation of frequency converters rectifiers. Analysis of the obtained solutions allows to make a quantitative estimation of interharmonics' and higher harmonics' levels as the markers of the voltage quality.

52. POWER QUALITY AND RESONANCES IN POWER SUPPLY SYSTEMS WITH NON-SINUSOIDAL LOADS

PAPAIKA Yurii, LYSENKO Oleksandra

National Mining University, Dnipro, Ukraine

The stress is made on the necessity to take into account the impact of higher while analysing the quality of voltage in power supply systems of coal mine. The process of resonancesinpower supply systems is explained in terms of physics, the sources generating this kind of interference are described**.** Mathematical dependences that allow to identify resonances in power supply systems are provided. The focus is placed on the feasibility of using spectral analysis in computations. To investigatethe understudied aspects of voltage quality and electromagnetic compatibility and

provide mathematical description for the analysis of resonances in electrical networks with powerful non-sinusoidal loads.

53. ECOLOGICAL ASPECTS OF IMPLEMENTATION OF ENERGY SAVING TECHNOLOGY ON THE ENTERPRISES OF FUEL AND ENERGY COMPLEX

PAVLYCHENKO Artem & NESTEROVA Olha

National Mining University, Dnipro, Ukraine.

The ecological consequences of operation of the enterprises of fuel and energy complex are analyzed. The regulations of changes for state of environment on the territories of coal mining were determined. The ecological state of the rock waste disposal areas of coal mines and ash-disposal areas of heat power plants was estimated. The complex of nature protection and energy saving technologies for coal mining enterprises is substantiated. The prospective of wastes use of enterprises of fuel and energy complex in different industries is determined. The ecological efficiency of implementation of energy and resource saving technology in energy sector of Ukraine is described.

54. IMPLEMENTATION OF ENERGY SAFETY POLICY IN UKRAINE BY MEANS OF ENERGY SAVING IN ELECTRIC DRIVE SYSTEMS

PAZYNICH Yuliya[1], KOLB Andrii[1], and POTEMPA Michał[2]

[1]National Mining University, Dnipro, Ukraine

[2]Geological Concern “Geobit”, Chżanów, Poland

The paper substantiates the need of implementation of energy saving policy in Ukraine on the state level. The changes of the structure of national production, implementation of energy saving technology are mentioned as the way of the policy implementation, as this would lower dependence from oil and gas import and lead to economy stabilization and provide the conditions for energy safety of the country. The proposed method of energy efficiency increase for electric drives with use of group power supply from common feeder bars of direct current with capacity storage, as well as normalizing of traditional power quality indicators by means of AVI of PWM connected in the system input enable significant energy saving on the national scale.

55. NEW ASPECTS TO DEVELOPMENT OF URANIUM DEPOSITS IN UKRAINE

PETLOVANYI Mykhailo

National Mining University Dnipro, Ukraine

The analysis of existing technology of uranium ore development made it possible to establish that the chamber systems with solid stowing provide uranium extraction by more than 0.01%. A significant amount of uranium ore reserves within the mine fields is very poor with a content of less than 0.01% and which presently are not exploited. In addition, on the surface within the mine shafts there are rock dumps in excess of 12 million tons of waste rock, which also contain uranium ores and should also be considered as promising reserves.

The existing extraction technologies in the world are analyzed and a new promising integrated approach for the reserves development within the mining enterprise is proposed for the uranium deposits of Ukraine, which includes: combined underground extraction of valuable ores by traditional chamber systems of development with solid stowing with underground extraction of poor ores within a mine fields and surface leakage of mining waste. The proposed approach to uranium mining requires further substantiation of its technological parameters.

This work was supported by the Ministry of Education and Science of Ukraine, grant No. 0116U008041 “Scientific Substantiation and Development of Energy Saving and Low Waste Technologies of Hydrocarbon and Mineral Raw Materials Extraction”,

56. INNOVATIVE TOOL OF GROUND OF LIFE CYCLE OF THE SPECIAL INFRASTRUCTURAL PROJECTS

POKOLENKO Vadym, BILYK Andrii & TESLENKO Pavlo

National University of Building and Architecture, Kyiv, Ukraine

Research of authors is sanctified to development fundamentally of new in organization building of tool of planning of life cycle of socially meaningful building projects in industry of water-supply and overflow-pipe, taking into account that the deposit of realization of such projects can result in system destructions in the communal sphere of metropolises and, even, to the techno genic catastrophes. In basis of the created tool a synthesis of the applied instruments is from organization of building, risk management, theory of the graphs and graphic visualization, functionally-cost analysis, cluster grouping, structural and design. The created tool allows: in the format of integral to recreate essence and specific of processes of investment cycle a by-analytical model for such projects - from initiation.

57. NPUT OF MODERN TOOL OF INTERNAL AUDIT AND OPERATIVE KONTROLING OF BUILDING PROJECT

POKOLENKO Vadym**,** IAKYMCHUK Iryna & ANIN Oleksandr

National University of Building and Architecture, Kyiv, Ukraine

Research architecture is sanctified to development and introduction of tool of internal audit and building project (ІАК-БП). The marked tool in the system of building project management is positioned as an original mechanism of self-regulation that provides a feedback in the contour of management and attracts the functions of account, analysis, control, co-ordination and informative providing together. On the basis of modernization of maintenance of the operating system of building project of forming of organizational structures of management of project offers at temporal administrative on the base of integration of fragments of administration by a project on different levels. Basis of managing kernel of created administrative a project office that coordinates activity of analytical will make.

58. MATHEMATICAL SIMULATION OF HYBRID VEHICLEMOTION

PROTSIV Volodymyr & BAS Tetiana

NationalMiningUniversity, Dnipro, Ukraine,

We present mathematical simulations of linear motion of a hybrid vehicle along a straight road segment as a motion of multimass system with eight degrees of freedom. We analyze the results of the study of hybrid vehicle dynamic and traction-speed performance in the course of motion. We made planar and spatial design diagrams and motion equations of the vehicle in the course of straight-line motion, considering elastic and dissipative characteristics of elastic constraints, longitudinal slope and road profile, changes of design characteristics, which can provide a near real picture of motion dynamics. We developedthe method of calculation of the hybrid vehicle dynamic characteristics in motion.

59. THE PROSPECTS OF THERMAL WATER EXPLORATION IN UKRAINE

SADOVENKO Ivan, RUDAKOV Dmytro & INKIN Oleksandr,

National Mining University, Dnipro, Ukraine

The total resources of geothermal energy in Ukraine up to the depth of 10 km are estimated at 10^{22} J, which significantly exceeds the reserves of fossil fuel sources. Nevertheless, geothermal exploration in each specific case requires comprehensive thermodynamic and feasibility studies taking into account local geological, hydrogeological conditions, and depth ranges. To facilitate such kind of studies an

analysis has been made for Ukraine's territory with the identification of aquifers that can be potentially used including the Transcarpathian trough, the Volyn-Podil'ska plate, the Dnipro-Donets depression, and Black Sea coast area. Regarding high thermal water mineralization a geo-technological scheme has been justified for environmentally safe exploration that suggests a closed cycle including (i) pumping out water to the surface, (ii) heat extraction, and (iii) re-injection of water into the aquifer. A mathematical model developed to evaluate the geo-circulation system effectiveness for various conditions allows predicting the changes in water temperature during circulation, power consumption, and heat capacity. Besides, the model enables optimizing the system performance depending on pumped water temperature. We assessed the effectiveness of geothermal heat extraction with the geo-circulation system in terms of profitability and net the present value (NPV). According to the estimations made for aquifers in Ukraine the geo-circulation system can be operated with the positive NPV in many regions of the country depending on the aquifer depth, heat flux, and groundwater flow. The obtained results correlate to the world standards of rational exploitation of geothermal energy.

60. A NOVEL APPROACH TO GAS HYDRATE OBTAINING FROM COAL BED METHANE

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The development of coal deposits in modern conditions requires the search for new solutions to a number of tasks for ensuring the safety of mine operation, complex development of mineral resources with the appropriate recovery of coal bed methane, the largest reserves of which are concentrated in Pokrovskyi and Donetsk-Makiivskyi geological industrial regions of Ukraine, with the gas conversion to the gas-hydrated state with the purpose of its use as an energy carrier фтв environmental protection.

The main ideas for obtaining gas hydrate from coal bed methane are based on the use of the surfactant and physical fields of influence of different spectrum in the process of gas hydrate formation and the obtaining of gas hydrates, taking into account the varying composition of gas mixtures and aqueous solutions for the possibility of establishing and substantiating the optimal parameters of the kinetics of gas hydrates formation. During this technology implementation, the transfer of the gas mixture into the gas-hydrated state, it is proposed to take into account the diffusion mechanism of the origin and growth of a new phase of the aggregate state of the substance and the thermodynamic potentials in the phase transition of the hydration process.

This work was supported by the Ministry of Education and Science of Ukraine, grant No. 0116U008041 "Scientific Substantiation and Development of Energy Saving and Low Waste Technologies of Hydrocarbon and Mineral Raw Materials Extraction".

61. STUDY OF METHODS AND DEVELOPMENT OF TECHNOLOGICAL SCHEME FOR HEAT REMOVAL FROM ROCK WASTE DUMP

SAIK Pavlo

National Mining University, Dnipro, Ukraine

The aim of this paper is to study the methods and develop technological scheme for thermal energy removal from coal mine rock waste dumps. The prospects of renewable energy sources development in Ukraine are analyzed. A number of available ways for using the sources of waste heat of mining enterprises, namely: outlet ventilation flow, mine water and other rock waste dumps, are investigated. The technological scheme of heat recovery from rock waste dump using heat pumps, which are component segments of the heat pump geosystem on the basis of borehole underground coal gasification, is developed.

62. SOME ASPECTS OF THE LOCAL STRENGTHENING, WHICH CAUSED THE ROCKMASS DESTROYING

SAKHNO Svitlana[1], ISAYENKOV Oleksandr[2] & RODZIN Stanislav[3]

[1]Donetsk National Technical University, Pokrovsk, Ukraine
[2]Krasnoarmeysk Industrial Institute, Pokrovskc, Ukraine
[3]AGH University of Science and Technology, Krakow, Poland

Justification the feasibility of the strengthening of the local rock ground excavation supported in the area of the damaged zone, based on dependences of horizontal consolidation and raise them in making the cavity pressure for different technological schemes to strengthen local. The results obtained with sufficient accuracy for practical application can be used to develop new ways to ensure the sustainability of the sole workings in cases where rocks have a large degree of destruction. The scheme of local strengthening, provided the theoretical substantiation of its parameters can be realized in mines lifting sole above 500 mm. This slows the velocity of deformities soles the improvement of the workings in difficult geological conditions.

63. ECONOMICAL ASPECTS OF GEMSTONE MINING AT IRON ORE DEPOSITS OF KRYVBAS

SHEVCHENKO Serhii

National Mining University, Dnipro, Ukraine

The main extraction methods using explosives and sparing technology are analyzed, the best technologies for accompanying mining of jaspilites and other gemstones at iron ore quarries of Ukraine are proved.

The proposed concurrent production technologies enable the development of ledges containing decorative jaspilite reserves, without affecting the primary production at mining and processing enterprises, developing deposits of ferruginous quartzite.

64. FORMATION OF BACK-EMF FOR COMPENSATION OF GROUND FAULTEMERGENCY CURRENTS AT ELECTRICAL LINE VOLTAGE OF 6-35 KV

SHKRABETS Fedir, AKULOV Artem & FEDOROV Serhii

National Mining University, Dnipro, Ukraine

One of the methods to increase the efficiency of distribution networks of 6-35 kV is the compensation of ground faultemergency currents. The essence of the proposed compensation method is imposing of extra EMF opposite in direction and equal in value to the zero-sequence voltage arising at these faults. The complexity of the implementation of the method is that the direction of the vector and the value of the zero-sequence voltage depend on the isolation parameters of the distribution network and the short-circuit. It was proposed to form the necessary back-EMF on the basis of inverters implementation.

65. OPERATING CHANGES IN CHARACTERISTICS OF POWER SUPPLY SYSTEMS ELEMENTS

SHKRABETS Fedir & KRASOVSKYI Pavlo

National Mining University, Dnipro, Ukraine

The report deals with the problems of power loss increase in the main elements of power-supply systems that have been operated for a long time. The degree of influence of the operation life and repairs of magnetic cores of power transformers on increase of the no-load power losses is shown. The main reasons for changes in time of no-load losses of power transformer under the long-term operation are formulated as well as the research results on the effects of aluminum corrosion on electric parameters of stationary transmission lines and energy losses are presented.

66. IMPROVING THE ENERGY EFFICIENCY OF PHOTOVOLTAIC SOLAR PANELS, WORKING IN CONDITIONS OF OVERHEATING

SHKRABETS Fedir & FEDOROV Serhii

National Mining University, Dnipro, Ukraine

The temperature rise of solar panels higher than its operational temperature of solar cell (NOCT standard) negatively affects their ability to generate electric power**.** To increase the energy efficiency of solar panels is possible byreducing the energy loss during the interaction of sunlight and substances in the photocells. Reducing of such losses will result in increase of solar panels'

efficiency. Increasing of the efficiency of even a few percent (especially in large solar power plants) will bring huge economic benefits.

It proposed for use Peltier elements with fans energized with energy from the same elements.as heat-sink (cooling) devices.

67. INVESTIGATION OF RENEWABLE ENERGY SOURCES POTENTIAL TO MEET THE NEEDS OF TRANSIT PIPELINES THROUGH THE DNIEPER RIVER WITHIN THE CENTRAL PART OF DNIPRO

SHKRABETS Fedir & LEONOVA Mariia

National Mining University, Dnipro, Ukraine

The possibility of using natural renewable sources in the central region of the city of Dnepr is shown. Power supply systems for lighting overpasses across the Dnieper River have been developed. It is shown that the use of renewable energy sources will allow to abandon the use of classical energy. Calculations are made for systems in which wind energy, solar radiation and kinetic energy of the river flow are used. Technical and economic calculations were performed.

68. POWER SUPPLY SYSTEMS FOR MOBILE FACILITIES AND REMOTE AUTONOMOUS CONSUMERS

SHKRABETS Fedir, BERDNYK Vladyslav & BERDNYK Lada

National Mining University, Dnipro, Ukraine

The issue of providing power to mobile facilities and remote autonomous low-power consumers is considered. The possibility of using alternative and renewable energy sources to provide uninterruptible power supply to designated users is analyzed. The fact that in the energy sector, the problem can be partially resolved through the development and implementation of mobile systems with combined main and standby power supply based on renewable energy sources is studied.

Attempts to justify the choice and combination of renewable and conventional energy sources in accordance with the given technological conditions in order to create a mobile hybrid system which guarantees uninterruptible power supply to low-power consumers of electricity are made. Furthermore, the system of its control under given technological conditions is suggested. It is emphasized that the development of hybrid power systems will reduce human impact on the environment, diminish capital costs and the operating costs for maintenance of power generating equipment that is used to supply power to mobile and remote electric consumers.

69. SUBSTATIATION PARAMETERS AND EFFICIENCY OF USING FEEDER-BREAKERS IN COMPLEX WITH BELT CONVEYORS

SHUSTOV Oleksandr

National Mining University, Dnipro, Ukraine

Purpose of research is to substantiate of collaboration parameters of feeder-breaker in complex with belt conveyor for rational using of equipment complex during dipping and development of lignite deposit working area. Firstly, rational parameters of collaboration feeder-breaker in complex with belt conveyor during transportation of watered rock mass based on mathematics modelling are substantiated. Relation between bunker's cubature and constructive parameters is established.

Practical implications is in furtherdevelopment of design documentation and finalization of production prototype of overloading complex in order to use it during stripping and lignite deposits mining. Time for dumping rate is directly proportional depends on digging dragline cycle, rock mass property, its cubature along with design features and natural and climatic conditions of deposits mining. At this time, a calculated amount of dimensions composed 473. A level of reliability composed 88.7 percent; equipment downtime for12-hour shift was 2.5 hour with an average digging dragline cycle about 61.4 seconds. Time for bunker unloading is 19.2 seconds.

For the furtherance of this purpose, the following methods are used: statistical data manipulation for research of digging equipment cycle during overloading of feeder-breaker by dragline; mathematical statistics and modelling for the determination of feeder-breaker cubature and dumping rate.

70. UNDER COMPLICATED GEOMECHANICAL CONDITIONS

SOLODYANKIN Olexandr, HAPIEIEV Sergehii
VYGODIN Mykhailo & YANKO Valentin

National Mining University, Dnipro, Ukraine,

Objective of the studies is the substantiation of energy efficient technologies to support permanent mine workings under complicated conditions of mines in Western Donbass. The results of analysis of geomechanical processes within rock mass neighbouring extended mine working have been demonstrated. The possibility to fill up underpropped area at different stages of a mine working construction has been shown. Efficient technology to improve the stability of mine workings by means of underpropped area filling up with hardening mixtures pneumatically has been considered. The results of the new technology to fill up underpropped area while constructing the main crosscut in Samarskaiamine ("DTEK Pavlogradugol" Company) have been demonstrated.

71. ECONOMIC EFFICIENCY OF USING EARTH-FAULT PROTECTION DEVICES

STEPANENKO Yurii

National Mining University, Dnipro, Ukraine

The existing earth-fault protection devices do not ensure the safety and reliability of operation of electrical networks with a voltage of 6 ... 10 kV. Due to ground faults, the proportion of downtime equipment is 50%. The use of protection devices based on modern microprocessor technology ensures the elimination of false alarms and plant downtime. This allows to significantly reduce economic losses. In addition, the social effect is to increase the level of electrical safety when operating networks and equipment with a voltage of 6 ... 10 kV.

72. ENERGY-SATURATED MATERIALS BASED ON TECHNOLOGICAL BIOMATERIALS

SVIETKINA Olena, LYSYTSKA Svitlana & FRANCHUK Vsevolod

National Mining University, Dnipro, Ukraine

The article considers the problem of improving the technology of obtaining energy-saturated materials, which results in an improvement of the characteristics of energy granules. We developed a technique for pretreatment of raw matirual in a continuous mode on a vertical vibratory mill. This contributes to the production of particles of the optimal granulometric composition.

73. ASSESSMENT OF ENVIRONMENTAL HAZARD OF UKRAINIAN POWER PLANTS WASTE

BORYSOVSKA Olena & PAVLYCHENKO Artem,
National Mining University, Dnipro, Ukraine

The problem of waste management of fuel and energy complex enterprises is considered. Attention is paid to the formation volumes of ash and slag of thermal power stations in Ukraine, as well as to the areas alienated for dumps. The ecological consequences of storage of thermal power plants waste on the earth's surface are considered.

The problems and contradictions existing in the legislative framework of Ukraine in the field of waste management and energy efficiency are discussed. The shortcomings in the existing approach for calculating the waste hazard class of thermal power plants are studied. It has been shown that in order to determine the hazardous properties of waste, it is not enough to use only five indicators that take into account the influence of the waste components only on the human body, without

taking into account their hazard for other living organisms and the environment. The alternative method of calculating the hazard class of waste formed on objects of fuel and energy complex is considered, based on comprehensive and detailed analysis of each ingredient of waste, taking into account its toxicological, ecological, sanitary-hygienic and physicochemical parameters.

74. ANALYTICAL STUDIES CONCERNING THE SHAPE OF METALLIC FRAME FLEXIBLE SUPPORT

TERESHCHUK Roman & HRYHORIEV Oleksii

National Mining University, Dnipro, Ukraine

Determination of rational values of curvature radii of roof beam and stands to solve the problem of selecting rational shape of metallic frame flexible support under various mining and geological conditions of coal mines. The necessity to solve the problem of the determination of rational shape of metallic flexible support has been substantiated. Methodology to solve the problem of improving metallic frame support with the help of analytic equations of structural mechanics is represented. Shapes of mine working cross-sections as well as metallic support depending upon coefficient of lateral spreading obtained as the calculation results have been obtained. Further tendencies in research to improve mine working support have been determined.

75. TEMPERATURE CORRECTION OF MOISTUREREMOVING PROCESS AT THE GRAIN DRYER ZSM WITH THE HEAT GENERATOR "GORINICH"

TKACHENKO Serhiy

National Mining University, Dnipro, Ukraine

The dryers of the grain of the model range of the ZSM, the production of the PE "Elevatorbudmash", from the city Kolomyia, in the basic version are equipped of a solid-fuel heat generator "Gorinich". The temperature characteristic of the drying agent of the heat generator is semi-periodic or pulsed in the range up to 30 degrees Celsius and is not subject to correction for the needs of the technological process.

This caues to overdrying or underdrying of grain, which on the one hand leads to overrun of solid fuels per tonne of grain, on the other to the need for re-drying. In the process of solving the problem of moisture removing automation, it is proposed to promptly correct the calculated speed of the rotation of the drying unloading rollers according to the readings of the temperature sensors. This will ensure uniform heating of the grain to the technologically determined drying temperature and reduce the deviation of the output moisture content of the grain from the target, which allows you to save fuel.

76. THE CHOICE OF ACCUMULATING ELECTRIC HEATERS CAPACITY IN INDUSTRIAL PREMISES

TRETIAKOVA Larysa
NTU of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute» Kiev, Ukraine

The choice of the heaters capacity depends on the terms of creation the thermal comfort for employees. It is proposed to take into account the receipt to heat from human bodies, solar radiation, technological equipment and computers, lighting device sand ventilation systems. Reducing the heat loss through the building design and additional heat input are considered. It makes possible to reduce the installed heater capacity up to 20 %.

77. ECONOMIC-MATHEMATICAL MODEL OF THE EFFICIENCY OF OPERATION OF UNDERGROUND ELECTRICAL NETWORKS OF COAL MINES

TRYFONOV Volodymyr, TRIFONOV Dmytro, KOVALEV Oleksand & KOLTSOV Igor
National Mining University, Dnipro, Ukraine

Modern coal mines are among the powerful highly mechanized mining enterprises with a complex electrical engineering. Improvement of energy efficiency at coal mines is possible due to the improvement of technological processes, as well as through the use of special means, among which the most effective is reducing power losses by compensating for reactive power. For this purpose, consumers of electric power install reactive power compensation devices (PCRP). The correct choice and the feasibility study of the rational distribution of the PCRP in the RPP-6 kV will significantly unload the entire electricity grid.

The proposed economic-mathematical model for determining the rational power values of PCRPs at 6 kV underground distribution points, taking into account the same capacities of explosive safe PCRPs.

78. ESTIMATING EFFICIENCY OF THE RENEWABLE ENERGY SOURCES USE FOR ENERGY SUPPLY TO ENERGY-SAVING BUILDING

TSYPLENKOV Dmytro & DUDNYK Mykola
National Mining University, Dnipro, Ukraine

The modern methods of building an energy-passive house have been studied. It is shown that with the use of alternative sources it is possible to provide the house with all kinds of energy. The following systems are considered as sources: photovoltaic panels - power supply of house systems, heat pump - heating system,

solar collectors - hot water supply system. The economic substantiation of the adopted decisions is carried out.

79. INVESTIGATION OF THE POSSIBILITY TO USE SOLAR COLLECTORS FOR THE SYSTEM OF COLD SUPPLY IN PREMISE

TSYPLENKOV Dmytro & KARCHYNSKYI Artem

National Mining University, Dnipro, Ukraine

The study of the possibility of using a solar collector for construction cooling systems is interesting and urgent for modern electrical engineering because in the range of renewable energy sources, solar energy is of particular interest for Ukraine's energy sector and industry. The main aim of our search is rationale of the parameters of the solar cooling system of the premises in order to create the specified microclimatic parameters for the – consumer. The reaching of the aim of the study should include solving of the following purposes:

- providing of schematic solutions for solar cooling;
- modeling of air conditioning system;
- automation of the solar cooling system.

80. ANALYSIS OF ENERGY EFFICIENCY OF URANIUM EXTRACTION BY GEOTECHNOLOGICAL METHOD IN UNDERGROUND CONDITIONS

VLADYKO Oleksandr & MALTSEV Dmytro

National Mining University, Dnipro, Ukraine

The innovative approach to ensuring energy efficiency of uranium oxide extraction from underground mining for poor and extremely poor ores is described. Input data for preliminary calculation of energy efficiency of leaching in underground conditions is prepared. Calculation scheme for determining the technical and economic efficiency of deposit leaching is adapted.

According to the scheme, a number of calculations are made: energy consumption for ore mass weakening in a compressed medium; the number of drilling operations and completion of input and output injector holes including the cost of materials; the amount of leaching agent taking into account its concentration and probable losses; the cost of pipelines and their installation, the quantity and type of pumping equipment for the transportation of productive and leachingsolutions to the surface and the chamber, respectively; consideration of performance of the contour tank for productive solution; cost of surface facilities and operations; construction of protective barriers to prevent the leakage of sulfuric acid vapor from drilling working to the atmosphere; labor costs, etc. The comparison of the value of uranium oxide obtained with this technology and the value of raw material obtained by development

method in the Vatutinske deposit is provided. The conclusions on the choice of energy-efficient technology for the investigated conditions are made.

Works were conducted within the framework of the projectGP-497: Resource-saving geotechnical and hydrodynamic parameterisation of producing low-capacity mineral raw materials in technogenically loaded environment.

81. ENERGY EFFICIENCY CONTROL OF TECHNOLOGICAL PROCESSES

VYPANASENKO Stanislav

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Methodology for energy efficiency control of technological processes is described. Regression models, based on results of the previous measurements, are used to control energy efficiency. Comparing actual energy consumption with the planned one let us control how these indicators differ from each other and take measures to deny the differences in future. Accuracy of the realized control is given.

82. NON-WASTE DISPOSAL OF USED AUTOMOBILE TIRES

VYNOHRADOV Borys & OSTASHKO Ihor

Ukrainian State University of Chemical Technology, Dnipro, Ukraine

The non-waste disposal of worn-out tires is considered, where in addition to obtaining liquid and gaseous fuels, a solid residue pyrolysis is effectively used. A technique for determining the power consumption for the grinding process has been developed. The aeromechanics of a centrifugal mill was studied. The possibility of using a grinded solid residue of pyrolysis as a substitute for technical carbon is shown.

83. SUBSTANTIATION OF PARAMETERS FOR THE TUNNEL ERECTOR WITH TWO MANIPULATORS

ZABOLOTNYI Kostiantyn, PANCHENKO Olena & ZHUPIEV Oleksandr

National Mining University, Dnipro, Ukraine

Lagrange equations of the second kind are used to describe the dynamics of three-link manipulator lever tunnel stacker. Relative angles of rotation of manipulators units chosen as the generalized coordinates. The problem of the direct dynamics of the manipulator is solved. Expressions control torques for the main types of motion manipulators is given. With an accuracy of 11 %, using the motion simulation built in SOLIDWORKS Motion trajectory. Conclusions are drawn about selected control laws allowing to minimize the working time spent on the installation of the lining elements.

84. ESTIMATION OF HYDRODYNAMIC FACTORS OF THIN COAL STRATA EXTRACTION USING SELECTIVE MINING TECHNOLOGY IN THE CONDITIONS OF WEST DONBASS

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Considering a hydrodynamic feeding pattern of coal strata, spreading conditions of water-saturated sandstone, technogenic loading on sub-surface and surface hydrosphere of West Donbass, the areas of perspective usage of selective mining technology for coal strata extraction are estimated. The dependencies of changes in geofiltrative and capacitive parameters of the rock mass using numerical mathematical modeling are established.

Implemented in the framework of the project GP-497, which is supported by the Ministry of Education and Science of Ukraine

85. ENERGY-EFFICIENT TECHNOLOGIES AS AN ELEMENT OF NATIONAL SECURITY OF THE STATE

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In the article actual geopolitical processes are considered from the point of view of the problem of redistribution of natural and energetic resources. It is noted that in the modern world, the foreign policy of most states is in one way or another connected with the problem of providing access to natural and power-producing resources.

Dynamic processes of changing energy efficiency technologies are analyzed as a factor influencing the possible fundamental change of the modern world political map as a whole and the role and status of individual states in particular.

The view is becoming actual, that it is the problem of energy security that is one of the key to understanding the foreign policy processes that are taking place around the modern Ukrainian state. A forecast is made regarding Ukraine's geopolitical prospects in the context of its opportunities to develop energy-efficient technologies.

86. CONCEPTUAL GROUNDINGS FOR GREEN ENERGY USE

ZHADIAIEV Denys
National Mining University. Dnipro, Ukraine

In this paper we consider ethical question of green energy use in the context of the science of the climate change, political response to a changing climate, market-

based approach, and from the sustainability paradigm. As a corollary, some ideas on how to develop convincing and proper demonstration for green energy use in the binary opposition environmentalists/corporations, were suggested. This paper refers not only to contemporary data analysis, but synthesizes both scientific and classical philosophical ideas, such as coherence of process philosophy and monism of Benedictus Spinoza, trying to overcome dualistic approach.

87. NUMERICAL MODELLING AS THE TOOL FOR STEEL-FIBER STRESSES DEFINITION

ZHURAVSKYI Oleksandr & GOROBETS Andrii

National University of Building and Architecture, Kyiv, Ukraine

Numerical studies of strength and deformability of steel-fiber concrete double-sided pre-stress plates at the action of transverse load in comparison with the experimental results. This will increase the technical indicators and reduce the cost of construction projects, which, as a consequence, will reduce their pricing policy.

88. TECHNOLOGICAL SCHEME OF WIND ENERGY PRODUCTION IN UNDERGROUND CONDITION OF MINE

YURCHENKO Kseniia

National Mining University. Dnipro, Ukraine

The analysis of wind energy generation in different location of wind generators is done. Technical justification of different wind generation systems is proposed. The proper equipment from well-known machinery producers is adopted to underground conditions of the mine. Scientific dependencies of power induction and power capacity from mining depths and depression are defined. Economical substantiation proves efficiency of given technological propositions.

The work contains results of researches on the project GP-472, which is supported by Ministry of Sciences and Education of Ukraine.

SECTION 2
ENERGY EFFICIENCY AND ENERGY SAFETY (SOCIO-ECONOMIC ASPECTS)

1. IMPLEMENTATION OF ENERGY EFFICIENCY PRINCIPLES BASED ON LOGISTICS

BARANETS Ganna

National Mining University, Dnipro, Ukraine

Energy crisis is defined to be a background for logistics development. Transformation of resource-saving logistics functions into the company's concept of providing energy efficiency is reported. Implementation of energy efficiency principles is considered through the coordination of supply chain participants. It explains the necessity to identify the economic and organizational principles of strategic partnership in supply chains. A special attention is paid to environmental aspects of energy efficiency logistic programs. Recycling logistics is defined as an applied tool for energy efficient technologies implementation in supply chains.

2. AIR PISTON COMPRESSORS

BOBROV Oleksii

National Mining University, Dnipro, Ukraine

The work defines the requirements and the list of controlled parameters of the on-off control system with the deterministic upper level of pressure of air piston compressor units. These parameters are determined taking into account the need to determine the energy losses in the elements of the electromechanical system "electric network - drive - compressor - pneumatic system". Also, the measures are described and described, the preliminary carrying out of which is necessary to determine the energy losses in pneumatic networks both at the pressure increase section and at the site of its reduction. From the above material, it can be concluded that the loss of energy in all elements of the electromechanical system can be determined by knowing one parameter the pressure in the pneumatic system and monitoring the rate of its change.

3. AUDIT AS ELEMENT OF SAFETY OF FUNCTIONING OF ENTERPRISE

BONDAR Olena & SHKUROPAT Oleksandr

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Increase of requirement in the increase of efficiency and economy of the use of IT, increase of advantages and removal of defects from their application, and

ground of charges on IT. For satisfaction of such necessity of all greater value regular application acquires in control system of enterprise of audit of information technologies, that in turn predetermines appearance of such profession as a public IT-auditor. IT-audit are a key component for providing of quality of the informative systems and application software. Without the reliable informative systems and effective IT-resach of control, the enterprise of not correctly to execute to the operation/of transaction and summarize the reliable financial reporting, that, it by a turn, influences on the level of achievement of the tasks and aims put before him. IT-an audit is an independent and estimation of reliability, safety (including safety of the personal data), effectiveness and efficiency of automated.

4. TOWN-PLANNING ADJUSTING: SYSTEM ELEMENT OF DEVELOPMENT OF BUILDING INDUSTRY

BONDAR Olena, TONKACHEIEV Hennadii & TESLENKO Pavlo

National University of Building and Architecture, Kyiv, Ukraine

In accordance with the operating release of Law, organs of local self-government, there are absent plans of zoning or detailed plans of territories of settlements on territory of that, practic ally confined rights on legal grounds to pass lot lands in property or use to the physical or legal persons, as a main condition of legality of acceptance of such decisions now is presence plan zoning or detailed plan territory. The marked circumstance negatively influences on the decision of questions of adjusting of the landed relations in most settlements of Ukraine, in fact they, unfortunately, for today do not have plans of zoning or detailed plans of territories. Taking into account a considerable cost and longtime developments of town-planning documentation, absence of the proper financing of the marked works due to budgetary facilities, and difficult politico-economy situation that folded in a country, development.

5. GROUND OF CONTROL EXPEDIENCY FUNCTION IN BUILDING

BONDAR Olena, TESLENKO Pavlo, KHOMENKO Oleksandr & SOTNIKOV Dmytro

National University of Building and Architecture, Kyiv, Ukraine

Central executive that will realize a public policy on questions state architectonically-building control and supervision body in the order certain a central executive that provides forming of public policy in the field of a town-planning body conducts the only register of documents, that give a right on implementation of preparatory and building works and certify an acceptance in exploitation of the objects information followed by building about a return on revision, refuse in delivery, abolition and cancellation marked document (farther is a register). Bringing of data to the register with the appropriation of registration number comes true

because of the information given by the organs of state architectonically building control, during one working day from the day of her receipt.

6. SOLIDITY OF FEATURES OF DEVELOPMENT OF MODERN ECONOMIC SYSTEMS

BONDAR Olena & KULIKOV Petro

National University of Building and Architecture, Kyiv, Ukraine

One of important features of development of science there is an origin enough difficult hierarchy of the specialized disciplines. Into place of ancient scientist-philosopher, such as Aristotle that could overcome practically all totality of accessible in his time knowledge, the generations of new scientists, that own the all no-bottom of knowledge and all greater narrowest of interests and competence, came. Probably, principal reason that generated a tendency to breaking up of science on narrow and narrowly specialized industries is limit nature of possibilities of human mind. As a volume of knowledge became moreover, what man in the state to perceive, any increase of knowledge certainly results in a volume, that a man can overcome his all less part. What deep are knowledge, that more specialized they must be.

So development of modern enterprise that takes beginning from development of domogospodarstva and shows a soba the difficult system that products totality of elements, basicas a base factor of development of market relations in Ukraine.

7. FINANCIAL POTENTIAL OF ENTERPRISE, AS FACTOR OF DEVELOPMENT OF ENTERPRISE

BONDAR Olena, KAPINOS Oleksandr & PETRENKO Ganna

National University of Building and Architecture, Kyiv, Ukraine

Financial potential is a criterion that determines capacity of enterprise for adaptation at the changes of the economic state of affairs, in fact, exactly he plays a ponderable role possibility of enterprise to generate the necessary volume of positive money streams, be investment attractive, liquid and financially reliable. To Tom, it is possible to assert that a process of forming of financial potential of enterprise is on the essence the difficult phenomenon that depends on many factors that is mainly controlled by the subject of manage. At the evaluation of financial potential enterprises, undertake to attention indexes of efficiency of the use of existent financial resources and strategic directions of development of business. However, through considerable dependence of financial possibilities of enterprise on changes in

an economic environment, it is necessary to take into account influence of factors that have influence on forming and use of financial potential.

8. PROFITABILITY OF BUILDING ENTERPRISE: THE ROW OF CERTAIN METHODOLOGIES AND MODELS

BONDAR Olena

National University of Building and Architecture, Kyiv, Ukraine

That is used on the certain stages of functioning of building enterprise has FEATURES of DETERMINATION AND VALUE of Determination of profitability of building enterprise. Each of that has the advantages; however has the opportunity to be used only on the certain stage. Comparative analysis of quality and quantitative advantages each in the general loop of functioning of enterprise showed variation application of heterogeneous models depending on the put aims and tasks and educed optimal efficiency of their use in short-term periods. The got results give an opportunity to assert for variation of the got results and their inaccuracy, as each of certain types of methodologies does not give end-point – determination of level of income. Except that, data of methodologies require certain specific skills and abilities.

9. SCIENTIFIC AND APPLIED PRINCIPLESPROVIDING FULL WORK OF TECHNOLOGICAL EQUIPMENT COMPLEXESIN QUARRY

DEMENTIEVA Nataliia

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The factors controlling the technology and mechanization of mining operations are established and regulated in conditions of the stable functioning of the system on the basis of the features and prerequisites for fluctuating of the operation of technological equipment complexes in a quarry. The theoretical foundations for ensuring stable equipment performance are generalized depending on the level of the organizational hierarchy of the quarry. Principal provisions for supporting the operational performance of equipment systems in quarries are defined. A theoretical approach to the development of software and mathematical support for models of mining plans is presented, which is the basis for the initial data for determining the volumes of overburden and minerals. Elements of software and mathematical support for the models of these works that form the basis of the initial data for planning the productivity of equipment are given.

10. METHODOLOGICAL PRINCIPLES OF ADMINISTRATIVE REGULATION OF INVESTMENT CAPITAL IN THE INDUSTRIAL REGION

DOSUZHIY Vladyslav[1] & BENDARAVICIENE Rita[2]

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The results of fundamental studies of Ukrainian and foreign scientists clearly indicate that the processes of economic growth are due to the volume and growth rates of investment, their structure and qualitative characteristics. Despite some revival of the investment process in recent years, positive trends in the investment sector of Ukraine have not yet become permanent. A large number of original and meaningful scientific works have been performed on this problem, but there are practically no methodological foundations for the formation of investment capital at the industrial level. Therefore, the generalization and development of methodological principles and practical recommendations regarding the efficiency of regulation and attraction of investment funds in the development of the region is an urgent task.

Now we can distinguish three main types of models of scientific and innovative development of industrialized countries: countries, focused on leadership in science, implementation of large-scale targeted projects; Countries that are focused on the spread of innovations, the creation of a supportive innovation environment; Countries that stimulate innovation through the development of innovation infrastructure. The most attractive sectors for investing in the Ukrainian economy were: industry - 58.15%; wholesale and retail trade, vehicle trade, repair services – 26.7%; real estate transactions, lease and services to legal entities – 8.99 % of total investments.

Taking into account the intense technogenic load in the region, a program to create a network of venture capital firms and research centers of resource-saving and nature protection areas, whose activities should be fully or partially financed from the state budget for the first 5 years, should be developed. Provide free licenses for the commercial use of inventions patented during the course budgetary research, which is state property.

11. ECONOMIC AND ECOLOGICAL ASSESSMENT OF NATURAL AND RESOURCE POTENTIAL OF LOCAL ACCOMMODATION

DUDNYK Alla

National Mining University, Dnipro, Ukraine

In the context of the paradigm of sustainable development, the problems of assessing the potential of accumulated municipal waste as secondary natural resources of urban settlements are highlighted. The reasons that cause environmental conflicts in urban areas are described and proposals for resolving conflicts are

described. The estimation of the volume of accumulated household wares and the estimated dynamics of their further accumulation are executed. Considered promising technologies of disposal and recycling of household waste. Their positive and negative aspects are shown and the possibility of their use in the region in the near future is estimated. The possibilities of using domestic waste for obtaining non-traditional energy resources and necessary investments for implementation of pilot projects aimed at improving the ecological situation in the region are estimated.

12. INFLUENCE OF VENTURE BUSINESS ON IMPROVING THE ENERGY EFFICIENCY OF THE "MINE – TECHNOGENIC RESOURCES" SYSTEM

HORPYNYCH Olexandr

National Mining University, Dnipro, Ukraine

The energy potential of the "Mine - Technogenic Resources" system is considered as interconnected subsystems of energy generation from geogenous and technogenic raw materials of the mining enterprise with application of traditional and innovative technologies. Subsystems are formed based not only on the planning and organization of coal mining, but also on the production of all types of energy on the surface of the mine complex. Each of these directions of obtaining energy has an innovative character of justification, implementation and operation. The implementation of such decisions is based on the principles of project management. This involves the development of investment projects, the rationale for funding sources and the mechanism for implementing the listed innovative solutions for the formation of various types of energy resources. The such organizational and economic mechanism is formed on the basis of the principles of venture business. Venture business organizations that implement innovative energy generation projects in the "Mine - Technogenic Resources" system " carry out entrepreneurial activities in the cluster "Mineral Technogenic Resources".

13. THE FEATURES OF FORMATION OF COMPETITIVE ADVANTAGES OF POWER ENTERPRISES

IURCHISHINA Liudmyla & KALIUZHNA Taisiia

National Mining University, Dnipro, Ukraine

Energetics is one of the leading sectors of the Ukrainian economy, which provides vital interests of the country, its economic security, social and cultural standard of living of the people. At the present stage of the transformational processes that dominate the world, when innovation, efficiency and competitiveness become the main tasks and signs of economic development, energetics becomes a key factor in technological modernization of the economy.

The current state of industrial development in Ukraine is characterized by a drop in investment processes and a lack of production. The industry has an advantage in industries with a low technological level, final consumption products are largely uncompetitive in foreign markets, and a significant gap in socio-economic development levels is slowing down the growth of the economy both in general and in the sectors of the national economy. Author's contribution consists in providing the most effective management tools of business competitiveness at present. The article deals the features of formation of competitive advantages of power enterprises.

14. IMPLEMENTATION OF ENERGY EFFICIENCY PROJECTS

KASYANENKO Lilia

National Mining University, Dnipro, Ukraine

Most of the domestic houses are built on concrete panel technologies. Therefore, the reconstruction of residential buildings is necessary. This, first of all, replacement of windows, doors, insulation of inter-panel roof joints, replacement of electrical wiring, insulation of ceilings and much more. In short, an energy audit is required to understand where large heat losses occur. Dnepropetrovsk region is one of the largest consumers of energy resources, because in this area the main number of industrial facilities that have large energy costs are concentrated. Last year, the regional budget of the city of the Dnieper was co-financed 40 projects on energy-efficient measures.

The experience of using the best projects introduced in Slovakia, which is a partner of Ukraine on this issue, is grounded.

15. AVAILABLE NATURAL RESOURCES: SOCIAL ASPEKTS OF ANALISES

KOLISNYK Larysa & MOSONDZ Maryna

National Mining University, Dnipro, Ukraine

One of the global problems of our time is the protection of the environment and the rational use of available natural resources. However, for today, among the main reasons of the unfavorable situation in the energy intensity of the Ukrainian economy is disinterest at all levels of government and the population in ensuring rational use and economical consumption of fuel and energy; insufficient provision of highly qualified management and engineering personnel in the field of energy conservation; completely inadequate energy-saving literacy of the population.

Today it is not enough to understand the need for energy intensity of production and thinking. We need a concept which would reflect a qualitatively new level of development of public consciousness. Its main characteristics should include: concern about the state of the environment; the ability to identify the source of the threat and the social entity that generates it; recognition of a healthy and safe living

environment of public value; individual mobilization, i.e. awareness of the need for personal participation in energy-saving activities; readiness to change the habitual way of life, reduce the structure and volume of consumption, and so on, and, finally, the formation of a high level of energy-saving literacy among mankind.

The realities of the Ukrainian society indicate not only the growing influence of energy saving factors on all spheres of the life activity of the population, but also on their involvement in the accumulation of the overall conflict potential in society.

The work contains the results of research on the GP-576 project, which is funded by the Ministry of Science and Education of Ukraine.

16. VARIATIVITY OF FORMING OF ECONOMIC INSTITUTES OF BUILDING MARKET

KULIKOV Petro & ANIN Oleksandr

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For today, an all-greater value is acquired by the range of problems of the investment providing of realization of building projects. A building market is a founder in creation and recreation of economic potential of population of the state. Market vibrations puts before enterprises building to the sector a number of tasks that do impossible stability of functioning of enterprises, in fact, a building project is the protracted cyclic process that in fact to it risky, as has certain duration (term of realization). And an economic effect from realization of any building project must in essence to give it permanent income. Therefore problem of sources of investing in building projects for today it is a concrete task, that contains in itself totality of variant heterogeneous factors, management that and it must provide permanent.

17. TECHNOLOGICAL RELATIONSHIP OF DISCLOSURE METHOD AND DEPOSIT DEVELOPMENT SYSTEM AS A LIMITATION FACTOR OF NATURAL RESOURCES USAGE

LITVINOV Yuriy

National Mining University, Dnipro, Ukraine

The relationships are analysed and methodological approaches to find a compromise between the natural resources limitations are formulated. The negative influence of mineral deposits development on the natural environment, on the economical use of land resources allocated for a career, is analysed. There is a lack of necessary mining technologies, which can increase the volume of return of land resources to be restored. The ways of technological solutions opening and development field relationship optimizing are defined as the main factor of the volume of natural resources usage limitation.

18 ROOTS OF SUSTAINABLE DEVELOPMENT IN THE MODERNIZED SOCIETIES

PERVYI Gennadii

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The report concerns the problems of the traditional and modern patterns in the contemporary society. The process of the modernization occurs usually in the most crucial spheres of the social life. The process of modernization proceeds at different speeds in the various social spheres. We usually consider the results of the modernization efforts in the society as the whole but we should keep in mind that some social spheres remained traditional. These areas of the social life could be considered like the roots of stability in the unstable society.

19. RESTORATION OF MAIN FUNDS AS A FACTOR OF ENERGY EFFICIENCY INVESTMENT OF ENTERPRISE ACTIVITY

PROKOPENKO Vasyl

National Mining University, Dnipro, Ukraine

The current state of industrial production and the peculiarities of its functioning testify to the fact that the basic means of production available at the enterprises not only do not meet the requirements of activating innovation activity in the future, but also due to the strong deterioration and aging, do not fully meet the production tasks of the present. Therefore, the purpose is to analyze, synthesize and evaluate the ecological and economic indicators of the production and economic activity of the machine-building enterprises of Ukraine in accordance with the requirements of a market economy and develop a methodical approach to managing their investments in an innovative development model.

20. THE MECHANISM OF STATE SUPPORT FOR ENERGY EFFICIENCY AND ENERGY SAVING IN UKRAINE

ROMANIUK Natalia[1] & SKONIECZNY Jan[2]

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Priority is given to the task of implementing energy-efficient measures. The mechanism provides for the reimbursement of part of the amount (from 20% to 70%) of lenders involved in the use of energy efficient materials and equipment. The term of payment of state support up to two months after the implementation of measures.

The advantages of the current mechanism of the state program of energy efficiency support are demonstrated, the essence of which is, firstly, the lack of motivation

to overestimate the borrower's loan amount, and secondly, a wide list of energy-efficient equipment and materials, thirdly, the insignificant terms for the reimbursement, the fourth, the exclusion of corruption risks etc. The state program is integrated with local programs. In 2017 there are 206 local programs of additional compensation for "warm" loans. However, there are disadvantages that need to be improved. Adopted regulatory framework for the introduction of the ECKO-mechanism in the budget sphere. The main principle is that the return of private investment in energy efficiency of budgetary institutions is solely due to energy saving. The results of the first 19 signed energy service contracts showed an annual savings of 15 %.

Thanks to state support, during the heating period of 2013 – 2016, new heat facilities for gas replacement were introduced at 1204 MW, which allowed the consumption of gas to be reduced by 30 % (7,2 billion cubic meters).

21 MODERN TENDENCIES OF LAND RECLAMATION AFTER OPEN CAST MINING OPERATIONS FROM THE PERSPECTIVE OF SUSTAINABLE LAND USE

TEREKHOV Evgen

National Mining University, Dnipro, Ukraine

The actual tendencies of planning the economic purpose of disturbed open land mines in the pan-European context are determined. The factors of choice of land use after open mining are established. The leading experience of the organization of sustainable land use in mining regions is analyzed. The most expedient variants of the planning of the structure of man-made lands are shown. The scientific approaches to technological lands developing activation are considered.

22. FACTORS OF ALTERNATIVE ENERGY RESOURCES INVOLVEMENT

TYMOSHENKO Liubov & HRYSHANINA Oleksandra

National Mining University, Dnipro, Ukraine

The factors that determine the development of clean energy are analyzed and systematized. The world macroeconomic factors, which determine the necessity of transition to sustainable development, are singled out. The factors of the national level, namely political, economic and social, are determined. Factors that influence on using of renewable energy resources in the municipal sphere are analyzed and detailed. They are systematized in such groups: state-political, natural-geographical, techno-technological, financial-economic and social-ecological.

23. INTERACTION OF THE FACTORS OF THE INTERNAL AND EXTERNAL CONDITION OF THE COAL-MINING ENTERPRISE IN THE CONTEXT OF PROVISION OF ITS SUSTAINABLE FUNCTIONING

TRYFONOVA Olena

National Mining University, Dnipro, Ukraine

The level of sustainable functioning of the coal-mining enterprise is considered in terms of the interaction of the factors of the external and internal condition of management. It is proposed to distinguish anthropogenic and natural components in the internal environment of the enterprise. The composition of the indicators of the level of enterprise's sustainable to the factors of the environment and the stability of the natural component are justified. The level of sustainability of the anthropogenic component of the coal-mining enterprise is considered in terms of the stability of the four components: technical and organizational, social and labor, environmental, financial and economic. A set of indicators describing each component of the anthropogenic constituent of the sustainable functioning of the coal-mining enterprise is proposed.

24. THE CONTEXT OF THE POSTMATERIALISTIC PARADIGM OF SCIENCE

SHABANOVA Yuliia

National Mining University, Dnipro, Ukraine

The article substantiates the conceptual foundations of the postmaterialistic paradigm of science, based on the achievements of quantum physics, synergetics, eniology and the theory of physical vacuum. The principles of the postmaterialistic paradigm (the ontological principle of holism, the principle of teleological hierarchy, the principle of materialistic-ideal complementarity, the anthropic principle of the predefinition of man and the world, the principle of the spiritual determiner of all theories of being) allowing to change radically the methods of energy use, applying the energy potential of the egregore for subtle, non-material matters of reality to upgrade the energy efficiency taking into account the axiological dominant, are explicated.

25. SOCIAL ASPECTS OF HUMAN CAPITAL FORMATION FOR ENTREPRENEURIAL ACTIVITY DEVELOPMENT OF THE POPULATION

SHAPOVAL Vadym & HORPYNYCH Olexandr

National Mining University, Dnipro, Ukraine

The socio-economic sphere of the vital activity of the population of Ukraine in the global information environment requires for the successful orientation of a person in the civilizational space the formation of a wide range of economic competencies. At the same time, the development of market relations provides for a high level of socio-economic, civic

culture of the entrepreneur. This determines the need of our society for quality economic and managerial education that provides fundamental and applied vocational training for the entrepreneur of the new formation. In addition to the actions of other factors the entrepreneurial activity of the Ukrainian populations determined by the level of development of human capital that is formed in the conditions of the knowledge economy. Systemic development of different types of human capital is based on attracting a wide range of people to business education, one of the concepts of which is the desire and the possibility of learning throughout the life. One of the tasks of business education is to offer a complex of educational services for different age and social segments of their consumers. This ensures that the level of human capital is consistent with the business environment.

26. ECOLOGICAL AND ECONOMIC JUSTIFICATION OF BIOENERGY RAW MATERIALS USE

SHEREMETIEVA Iryna & IAREMCHUK Iryna

National Mining University, Dnipro, Ukraine

It has been established that biomass from agricultural waste is one of the most attractive energy resources at the local level. In doing so, account must be taken of the availability, environmental friendliness and the need for biomass utilization. The ecological and economic benefits of growing energy plants in agro ecosystems characterized by various negative features and briquetting of bioenergy raw materials are highlighted. Ecological and economic feasibility of using biomass for energy supply of local objects is determined.

27. SOME ASPECTS OF SUSTAINABLE BUSINESS DEVELOPMENT IN UKRAINE

SOLIANYK Liudmyla

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It is proved that efficiency of functioning and developing of small business enterprises is the main direction of the sustainable business development in our country. A mechanism of the economic growth for small business has been suggested which includes mechanisms of government and non-government support as well as an internal mechanism of managing small business entities and provides the interaction of all the elements of the system.

28. ECONOMIC CONSEQUENCES OF DISPOSING RADIOACTIVE WASTES OF FUEL-AND-POWER CYCLE ENTERPRISES

VAHONOVA Oleksandra, ARZHEVICHEV Dmytro &

CHERKASHCHENKO Olesia

National Mining University, Dnipro, Ukraine

Economic evaluation of losses conditioned by disposing radioactive wastes of the "Prydniprovskyi Chemical Plant" Production Association on the territory of Kamianske and surrounding areas of the Dnipropetrovsk region is performed. While analysing losses, four uniform groups of expenses and losses were distinguished which include: expenses on protecting and monitoring measures, expenses on remediation measures, social orientation expenses and expenses related to waste disposal. It is shown that expenses on protecting and monitoring radioactive waste storages prevail.

29. INCREASING OF THE ENERGY EFFICIENCY OF BUILDINGS AND PUBLIC CONSTRUCTION FACILITIES

VARIANYCHENKO Olena

National Mining University, Dnipro, Ukraine

It is considered that energy consumption by public buildings and facilities represents a significant share of the energy balance of any country, including Ukraine. Given the growing financial problems of local authorities and the need to improve the energy efficiency of buildings, saving in this area is a modern direction of energy management. As a rule, an audit is conducted, the purpose of which is to determine the optimal directions of thermomodernization, then a project is drawn up and a contract is concluded with the contractor on implementation. The disadvantage of this approach is the absence of subjects responsible for the final effect of the action, it is difficult from the customer to expect the availability of the necessary knowledges to check the decisions made, very often the effects are not optimal, and the investor has no tools for their control and enforcement. As a rule, the savings achieved are so small that there is no economic justification for investing in such activities. The expediency of using the positive experience of Poland in the implementation of the Siemens project, which assumes an integrated approach to the implementation of projects, obtaining a permit for construction and performance of works, modernization of heating units and boiler houses, lighting, insulation of walls and windows, is justified. The core of all Siemens projects is the development of a remote monitoring and energy management system connected to the Advantage Services (ASC) Service Center. In the first year, savings leave is 30-50% of existing heat consumption.

30. ECONOMIC EFFICIENCY OF ENERGY SAVING POLICY IN UKRAINE

VOLOTKOVSKA Yuliya

National Mining University, Dnipro, Ukraine

Now a new stage of the investment policy is launched in the energy market of Ukraine that provides for the restructuring of the gas market, growth of environmental requirements, a radical change in the nature of demand and the status of the consumer of energy, technological solutions, new consumers and new suppliers. The authorities of all levels are prioritizing energy saving policies in Ukraine.The result of the project idea introduction in the form of a regional program will be the massive use of facilities for the decentralized production of an alternative energy source in agriculture, which will solve the problem of processing livestock and poultry waste.This will allow the agrarian sector to get an economic push by creating new jobs in the production sphere, increasing revenues to local budgets in the form of appropriate taxes and partially solving the issue of a number of non-gasified settlements in the region. Implementation of the planned stage is possible with proper allocation of the state and local funds from, as well as possible attraction of investment and grant financial resources.

31. ETHICAL ASPECTS OF SCIENCE AND ENGINEER'S EDUCATION IN XXI CENTURY

YAROSH Oleksii

National Mining University, Dnipro, Ukraine

The analysis of a situation in environmental problems, which must be resolved in two main directions: scientific researches and education of engineers, that is limited by rules of obsolete educational system and general lacks of upbringing is done. Argued, that in the secondary school programs "ecological" disciplines are absent, at the same time in Higher Education "ecological" disciplines was present as the secondary and noncompulsory subjects. The problem of ecological information vacuum, which cannot be filled in existing narrowly specialized educational system, is showed. Dependencies of educational involving to the ecological issues are defined. The improving of educational system in Ukraine as to its efficiency and integration through the scientific and pedagogical comprehension of the environmental problem with regard for opportunities of the social-cultural impacts of ecological education in the society is recommended.

The work contains results of researches on the project GP-489, which is supported by Ministry of Sciences and Education of Ukraine.

32. FINANCING INNOVATIVE MEASURES IN THE ENTERPRISE.

Donets Nataliia

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Implementing innovative measures at an enterprise in the current conditions of a market economy is vital for Ukrainian enterprises. Introduction of innovation depends on the financial condition of the enterprise. Innovative activities at an enterprise are financed via investments in fixed assets of the company's own funds. This mentioned source of financing of investments has a number of shortcomings, since the system of accrual and use of depreciation funds used in Ukraine does not create the necessary conditions for the renewal of fixed assets and formation of investment resources, nor is it a real reflection of the efficiency of the enterprise. The main direction of increasing the efficiency of production should be innovative development of the domestic economy, by increasing investment in the real sector of the economy as well as the share of investment in long-term projects.

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