

Pavlov I.V. **All the best still ahead**

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© **Improved production technology of motor gasoline JSC “Angarsk petrochemical company”**

Keywords: catalytic reforming, izomerizat, oksigenaty, MTBE, benzene, distillation column.

Abstract. The article describes the production phases of the improvement and development of the structure of production in JSC ANGARSK PETROCHEMICAL gasoline "before switching to gasoline production relevant requirements of the technical regulations. Presents the technological possibilities of the rectification separation unit katalizata reforming unit in order to reduce the benzene content.

Angarsk petrochemical company JSC

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© **Organization of production in JSC “Angarsk petrochemical company” of diesel fuels, corresponding to modern requirements**

Keywords: Diesel fuel quality, modernisation and reconstruction of the L-22/6 unit

Abstract. In the article are described works to modernize the production of diesel fuels JSC "APCC", which are allowed to move to producing diesel fuels, which are correspond all modern standards, within target dates.

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All-Russia Research Institute of Oil Refining JSC;
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© **Selection and justification of process modernization and development of lube oil production in JSC “Angarsk petrochemical company”**

Keywords: information technology, base oils, product quality, process modernization.

Abstract. The article sets out the results of market research for different lubricating oils brands. There also the history of lube oils production development their quality and quantity characteristics are described in this article. Attention is paid to the current production of oils and application of new technologies for high viscosity base oils in JSC «ANHK».

Angarsk petrochemical company JSC-Lube oils plant, Angarsk

Kondakov A.V., Kovalenko M.V., Laptev P.V.

© **Operating experience of catalytic cracking catalysts containing no rare earth metals**

Keywords: catalytic cracking, constant-flow reactor, catalyst.

Abstract. The catalytic cracking unit is a part of the GK-3 complex and is operated since 1968. In 2000-2003 reconstruction has been carried out of the reactor and regenerator block with introduction of catalytic cracking in direct-flow reactor technology. Due to the sharp rise in price of rare-earth metals in the world market in 2010, and as a result to rise in price of cracking catalyst, specialists of Grace GmbH offered a catalyst of RESOLUTION family which does not contain rare-earth metals, the Resolution-160. Since April 4, 2012 in the catalytic cracking block of the GK-3 unit the replacement of Omnikat-360 catalyst by the Resolution-160 was performed. Operating experience of new catalyst for cracking in direct-flow reactor is described in the article.

Angarsk petrochemical company JSC

Raskulov R.M., Kovalenko M.V., Elshin N.A., Kunitsin A.V., Kiryukhina S.A.

© **JSC “Angarsk catalyst production and organic synthesis plant” reforming catalyst handling experience on catalytic reformer plant JI-35/11-1000 of the Refinery of JSC “Angarsk petrochemical company”**

Keywords: catalytic reforming, catalyst.

Abstract. The article is devoted to experience of exploitation JSC «APCC» refineries SCR unit, introduced common characteristics of the catalysts, outputs, process conditions and described modernization stages of the unit.

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Portnov S.V., Chalbyshv S.A., Dubrovsky D.A., Zakazov A.N., Abdullaev A.D., Shvaley E.E.

© Experience in operating a high-pressure units of JSC "Angarsk petrochemical company"

Keywords: high-pressure equipment, high-pressure units, synthetic liquid fuel, oxo synthesis, ammonia synthesis, methanol synthesis, hydrocracking oil fractions.

Abstract. The article describes the operation of the equipment units of high pressure, resulting from post-war Germany under the terms of repair. The equipment had been mounted on the Angarsk pro-industrial site since 1949 and until 1953. The equipment was originally supposed to be used for making synthetic liquid fuels based on the coals of Cheremkhovo coal field.

Similar enterprises were established in the Salavat (Bashkortostan) and Novo-Cherkassk (Rostov region), but synthetic liquid fuel was only produced in the industrial scale in Angarsk. The main blocks of high-pressure apparatus are reactors and heat exchangers. The number of reactors, depending on the process varies from 1 to 3 units. Inside the column there are seven plates filled with tableted catalyst. The reaction column: diameter external – 1410 mm, inner diameter – 1000 mm, height – 18 m, pressure – up to 70 MPa, unit weight – 149 tons, case material – 24CrMo10.

Heat exchanger: Inner diameter – 600 mm diameter external – 860 mm, height – 18 m, the surface heat transfer – 190 m², pressure – up to 70 MPa, temperature – 450/380°C, unit weight – 48 tons, case material – 24CrMo9.

Nowadays the blocks of high pressure due to their versatility are used for various hydrogenation processes at a chemical plant and plant oils of JSC "ANHK": oxo synthesis (raw material propylene and syngas, T = 150–185°C, 20–30 MPa, the catalyst – carbonyls of cobalt); ammonia synthesis (raw nitrogen and hydrogen, T = 380–550°C, P = 30 MPa, catalysts NKM-1 and SA-1V); methanol synthesis (synthesis gas feed, T = 340–370°C, P = 29–32 MPa, the catalyst SMS-4); hydrotreated diesel fuel production (T = 380–420°C, P = 32 MPa, the catalyst NWS-A); hydrocracking oil fractions (vacuum distillate feedstock, T = 360–420°C, P = 20–30 MPa), and others.

Angarsk petrochemical company JSC

Abramov V.Y., Dekanova N.P., Khan V.V.

© Optimization of petrochemical production facility cooling systems

Keywords: cooling towers operation optimization, heat balance, petrochemical plant cooling system, mathematical modeling, heat pump.

Abstract. Product quality and energy efficiency of numerous processes in oil refinement and petrochemical production depend strongly on the cooling systems efficiency. For improvement of the energy efficiency of petrochemical plant cooling system various technical solutions such as cooling towers operation optimization, and water coolers operation regulation are considered. In the cases of stringent requirements to the depth of petrochemical product cooling, heat pump using is reasonable.

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National Research Irkutsk State Technical University*

Bykov S.P., Trutaev S.Yu., Kuznetsov K.A., Mukhin S.V., Minenko N.N.

© Approaches to the evaluation of the technical condition of fixed assets petrochemical enterprises in implementing them modern strategies of maintenance and repair

Keywords: MRO, stress-strain state, acoustic emission.

Abstract. The approaches, applied by JSC "IrkutskNIIhimmash", to ensure the safe operation of equipment, buildings and constructions of the chemical and petroleum industries, as part of the introduction of advanced technologies in the enterprises of maintenance and repair (MRO) are shown. It was proposed to use the stationary systems of diagnostic monitoring as a means of ensuring continuous monitoring of static industrial equipment, as part of its transfer to operate on the actual technical state. The article shows the scope and results of the monitoring of a number of industrial units: transfer pipelines of vacuum column K-11 ELOU+AVT-6 JSC "ANKhK"; supporting structures of industrial single-story building with an overhead crane in Irkutsk; reactor R-101 vol. 225/1 p. 8/14 of JSC "Angarsk petrochemical company". The advantages of a concept, developed by JSC "IrkutskNIIhimmash", to ensure industrial and environmental safety of fixed assets of industrial enterprises are presented.

*IrkutskNIIhimmash JSC;
Angarsk petrochemical company JSC*

Kazakov N.B., Chalbyshv I.S., Zelenskiy K.V., Yesipenko S.M., Maysel I.G.

© Practice of rifled pipes treatment for process furnaces of high-pressure units

Keywords: kilns, finned tubes for, tungsten carbide cutters.

Abstract. This article sets forth a history of collaboration between specialists of Irkutsk State Technical University and JSC "Angarsk petrochemical company" (JSC ANHK) on development of rifled pipes high-

strength deposit treatment technology and engineering of an equipment system for its implementation. The most interested works of the university staff on improvement of rifled pipes treatment and ensuring the equipment safe operation and innovation-driven growth of JSC ANHK are set out in this article. There different examples of rifled pipes high-strength deposit treatment methods together with assessment efficiency are shown here. In collaboration with the Company specialists a set of work on choosing the most effective way of the pipes heat conductivity recovery and preparation for equipment maintenance and equipment operation have been accomplished.

Introducing of these designs reduces maintenance time whereas improvement of technical condition and remaining lifespan ensure adequate industrial safety.

Angarsk petrochemical company JSC; Irkutsk State Technikal University

Zamyatin M.V., Manturov V.Y., Chistova E.I

© **Production process accounting system implementation with the use of the PI System software products in JSC “Angarsk Petrochemical Company”**

Keywords: SCADA, info system (IS), supervisory control.

Abstract. The article describes development, implementation and operation aspects of automated production process accounting system, including process monitoring systems, supervisory control, laboratory information management and material balance calculations implemented in JSC “Angarsk Petrochemical Company”.

Angarsk petrochemical company JSC

Kuznetsov Yu.P., Bondarchyuk R.A., Il'in E.N.

© **Experience in establishing and developing the logistic system for shipping out products from JSC “Angarsk Petrochemical Company”**

Keywords: Logistics, shipment products, logistic system, coordinating activities, IT solutions.

Abstract. The main principles of establishing the logistic system, as part of logistics of a vertically integrated company, implemented into practice are considered in the article. Fourteen years' experience of creation, establishment and development of the logistic support process for shipping out finished products from JSC «Angarsk Petrochemical Company» is shown. The practices of coordination of works of logistic system participants and integration of the activities of organizations into the system are given. The arrangement of a united dispatching center based on process management approach is described.

The article is also focused on the IT solutions in logistics of the finished product shipments out from JSC APC implemented in «The Automated Information System for Accounting and Control of Oil Product Flows in a Distribution Network» (AIS TPS).

Angarsk petrochemical company JSC

Bozhenkov G.V., Gubanov N.D., Kuzora I.E., Smorchkov S.E., Maruschenko I.Yu., Dyachkova S.G.

© **Waste management of oil refining, problems and solution**

Keywords: refining, composition of the waste oil refining, waste management of oil refining, rectification, centrifugation, demulsifiers.

Abstract. On the example of setting the G-64 of JSC "ANKhK" found that the main problem of waste oil refining method of rectification is unstable heat and mass transfer characteristics of the column and as a consequence the low quality division of pot product. The reason for this is the mixing in the trap all incoming flows with different composition and physic-chemical characteristics, the lack of separation of water and mechanical impurity. Selecting and optimization of methods of preparation and separation of flows was conducted based on the study of rectification flows, including the methods of mathematical modeling, the use of sedimentation, centrifugation and combining them with a demulsifier (Dissolvan 3359). It was shown that the pot is formed from petroleum stream of two types of "A" (69.1%) and "B" (30.9%). Rectification of mixture "A"-flows gives the following fractions s.b.-180°C (45%); 180–350°C (50%); mazut (5%). The water contained in the mixture "B"-flows (45%), strongly distorts the process of rectification. Water is separated centrifugation. Fractionation of hydrocarbon phase gives the following fractions: 10% water, 16% of s.b.-180°C, 6% of 180–350 and 23% of mazut. Fractionation of the mixture ("A"-flows + hydrocarbon phase "B"-flows) gives: 4% water, 42% of fr. s.b.-180°C, 42% of fr. 180–350°C and 12% of mazut. Developed a schematic diagram of the preparation and processing of oil pot, is to separate all the flows into two groups – the "A" and "B", the combined organic phase obtained after centrifugation of the "B"-flows with flows type "A" for fractionation.

Irkutsk State Technikal University; Angarsk petrochemical company JSC