

Creation of «Bus fleet-gas-filling complex» system

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2019, Institute of Advanced Scientific Research, Inc.. All rights reserved. The article presents the system "Bus fleet-gas filling complex", as well as its composition and the character of interaction between the elements of this system, which determine the very structure of the system. They use the information characterizing the gas filling complex and the key customer of the gas fuel-the bus fleet as the basis of the developed system. In order to develop the system structure, they applied decomposition methods and system synthesis method. Based on the decomposition, the elements were identified making up the system. These elements are the parameters and the information, characterizing the bus fleet and gas-fuel complex separately. The parameters and the information characterizing the bus fleet are the following ones: vehicle overall dimensions, the information on the route operation, the coordinates for the location of the temporary (route waiting sites) and night (parking lot and ATP garages) parking sites. Parameters and information characterizing the gas filling complex: the remoteness of refueling stations from transport location sites, refueling capacity, geometric dimensions of a station. On the basis of synthesis, intermediate links between the main elements were developed and constraints and requirements acting on the system were revealed. All information is reduced to a graphical representation of system element interconnections.

Keywords

Filling stations, Gas motor fuel, Natural gas, Regular transportation, Vehicle

References

- [1] Dolgov A.S. Model program of Russian Federation subject: a unified approach to the development of gas-motor fuel regional market / A.S. Dolgov, K.I. Golovshchinsky // The gas industry.-2015.-No. S3 (728).-pp. 20-25.
- [2] Bondarenko E.V. On the issue of the program "The expansion of vehicle fleet operation on natural gas and the regional filling network until 2015 and for the future until 2020" development and implementation / E.V. Bondarenko, A.A. Filippov, R.T. Shailin // Actual issues of transport complex innovative development: the materials of the 3rd international scientific and practical conference.-Orel: FSBEI HPE "State University-UNPK", 2013.-pp. 41-45.
- [3] Bondarenko E.V. On the need to develop a network of methane gas stations in Orenburg / E.V. Bondarenko, A.A. Filippov, M.R. Fazullin et al. // The World of Transport and Technological Machines.-2012.-№4.-pp. 15-23.
- [4] Bondarenko E.V. Development of gas-filling infrastructure, adapted to the parameters of passenger route transport operation / E.V. Bondarenko, R.T. Shailin, A.A. Filippov, V.A. Sologub // International Scientific and Research Journal.-2017.-No. 1 (55).-pp. 25-29.
- [5] Tahmassebpour, M. Methods and Algorithms of Capacity Calculation, and Increase Throughput in Wireless Sensor Networks base of ZigBee: A Survey. Indian Journal of Science and Technology, 2016, No. 9 (26).

- [6] Farzaneh-Gord M. Selecting optimal volume ratio of reservoir tanks in CNG refueling station with multi-line storage system / M. Farzaneh-Gord, M. Saadat-Targhi, J. Khadem // International Journal of Hydrogen Energy. - 2016. V. 41. - P. 23109-23119.
- [7] Saadat-Targhi M. Thermodynamic analysis of a CNG refueling station considering the reciprocating compressor / M. Saadat-Targhi, J. Khadem, M. Farzaneh-Gord // Journal of Natural Gas Science and Engineering. - 2016. V. 29. - P. 453-461.
- [8] Farzaneh-Gord M. Effects of natural gas compositions on CNG (compressed natural gas) reciprocating compressors performance / M. Farzaneh-Gord, A. Niazmand, M. Deymi-Dashtebayaz, H. R. Rahbari // Energy. - 2015. V.90 (Part 1). - P. 1152-1162.
- [9] Baratta M. Method for the recognition of the fuel composition in CNG engines fed with natural gas/biofuel/hydrogen blends / M. Baratta, S. d'Ambrosio, D. Iemmolo, D. Misul // Journal of Natural Gas Science and Engineering.-2017. V. 40. - P. 312-326.
- [10] Seyedhosseini, S. M., Esfahani, M. J., Ghaffari M. (2016). A novel hybrid algorithm based on a harmony search and artificial bee colony for solving a portfolio optimization problem using a mean-semi variance approach. Journal of Central South University, 23(1), 181-188.