Iterative algorithm for large hydraulic problems oil and heat transfer

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Program was designed and introduced to use the heat network of Omsk city and Academgorodok of Novosibirsk city. Program functions are following: system database keeps information on the composed (elements, their features, topology of network) hydraulic systems. Suitable graphic interface ensures quick and user friendly access to these data, allows to produce their change and addition. After some years of use no wrong calculations was detected and this appeared to very helpful for minimization of energy losses.

Next application can be related to the problem of optimal petroleum transfer regimes seeking for oil pipelines. There are usually two or more pipes with several petroleum intake and outlet points. Program was applied and now is in daily use for search of optimal and safe work regimes for pipeline pumps. There are limitations set on the pressure and calculation of necessary choking are since that emerging.

There are needs for calculations on two scales. One scale is on order of 5-10 km and second scale is on order of 100 km and more. Find optimal regime we should calculate about nearly 10^6 variants of regimes. In order to find optimal regime we can divide power on equal parts along pipeline distance as initial approximation. Now program is in industrial daily use as a dispatcher tool for optimal regimes search.