

In the period from November 2015 to August 2016, on wells No. 298, 338, 349 of the Pashninskoe field of the TPP "LUKOIL-Ukhtaneftgaz" and No. 4156, 4166, 5113 of the Kharyaginskoye field of the TPP "LUKOIL-Usinskneftgaz", pilot industrial tests were conducted of the sucker rod pump (SRP) control system "WellSim" manufactured by LLC "Naftamatika".

The following results were obtained from the conducted pilot industrial tests (PIT):

1. As of 01.08.2016, all monitored wells are in operation; no failures of the tested equipment occurred; accumulated run time amounts to 249–262 days. At the current moment, it is not possible to assess the increase in the inter-repair period of the wells following the implementation of the SRP control system compared to the average run time for these wells; the assessment must be conducted after a failure of the surface or downhole equipment of the well.
2. Based on the measurements of electrical energy consumption conducted, the energy efficiency of applying the SRP control system compared to standard SRP control stations has been confirmed for 4 out of 6 wells (67%). The increase in electricity consumption for two wells (No. 5113 and 4156) is due to the fact that, as a result of optimizing the operating mode of the wells, the "WellSim" controller increased the daily operating time of the sucker rod pump unit (SRPU).
3. The implementation of the SRP control system manufactured by LLC "Naftamatika" on wells No. 5113, 4166, 4156 of the Kharyaginskoye field, operating in intermittent mode, demonstrated high effectiveness in terms of optimizing the SRPU operating mode. An increase in the continuous operating time of the SRP was achieved for all wells. For wells No. 298, 338, 349 of the Pashninskoe field, the operating mode before and after implementation did not change. Therefore, the success criterion is met.
4. Based on the measurements conducted, the discrepancy between the calculated liquid flow rate of the "WellSim" controller and the actual liquid flow rate obtained by instrumental measurement, after calibration of the SRP control system, amounted to 2.4–4.2%. Therefore, the criterion specified in the PIT program has been achieved. However, it is necessary to note the requirement to calibrate the SRP control system after installation on the well.

### **Conclusions:**

1. Based on the comparative results of the SRPU productivity measurements (well-test separator — SRP control system), the applicability of the "WellSim" SRP control system as an alternative to existing devices for measuring SRPU liquid flow rate has been confirmed.
2. The use of the SRP operating control system is recommended for the purpose of improving the energy efficiency of SRPU operation (compared to SRPU control stations without a variable frequency drive).
3. The use of the SKD-15 "WellSim" SRP control system is recommended for wells requiring optimization of SRPU operation (the pool of wells operating in intermittent mode).