A New Software for Management, Scheduling, and Optimization for the Light Hydrocarbon Pipeline Network System of Daqing Oilfield

Yongtu Liang[1], Xiaxue Jiang[2, *], Jiexun Li[3]

[1]Department of Petroleum Engineering, China University of Petroleum, Beijing, China.

[2]Department of Oil and Gas Storage and Transportation Engineering, China University of Petroleum, Beijing, China.

[3]Daqing Oilfield Company, Heilongjiang, China.

Received 22 May 2013; received in revised form 30 August 2013; accepted 02 October 2013

Abstract

This paper presents the new software which specifically developed based on Visual Studio 2010 for Daqing Oilfield China includes the most complex light hydrocarbon pipeline network system in Asia, has become a powerful auxiliary tool to manage field data, makes scheduling plans for batching operation, and optimizes pumping plans. Firstly, DMM for recording and managing field data is summarized. Then, the batch scheduling simulation module called SSM for the difficult batch-scheduling issues of the multiple-source pipeline network system is introduced. Finally, SOM, that is Scheduling Optimization Module, is indicated for solving the problem of the pumps being started up/shut-down frequently.

Keywords: Daqing Oilfield, scheduling plan, batching operation, scheduling optimization

References

[1] H. Cao, "Study on way of hydrocarbon single transportation base on batching operation," China Petroleum and Chemical Standard and Quality, vol. 31, no.9, pp. 56-57, 2011.

[2] C.A. Me´ndez, J. Cerda´, "An efficient MILP continuous-time formulation for short-term scheduling of multiproduct continuous facilities," Computers and Chemical Engineering, vol. 26, pp. 687–695, 2002.

[3] D.C. Cafaro, J. Cerda´, "Dynamic scheduling of multiproduct pipelines with multiple delivery due dates," Computers and Chemical Engineering, vol. 32, pp. 728–753, 2008.

[4] D.C. Cafaro, J. Cerdá, "Optimal scheduling of multiproduct pipeline systems using a non-discrete MILP formulation," Computers and Chemical Engineering, vol. 8, pp. 2053–2068, 2004.

[5] R. Rejowski, J M. Pinto, "Scheduling of a multi-product pipeline system," Computers and Chemical Engineering 27, pp. 1229-1246, 2003.

[6] S. Jiewei, "The study of oil production and transportation scheduling," Master.dissertation. Zhejiang Univ., Hangzhou, China, 2003.

[7] X. Chu and D. Yu, "Process simulation for products batch transportation," Oil & Gas Storage and Transportation, vol. 18, no. 4, pp. 1-4, 1999.

[8] D. C. Cafaro, and J. Cerda, "Optimal scheduling of refined products pipelines with multiple sources," Computers and Chemical Engineering, vol. 14, pp. 6675–6689, 2009.

[9] V. Cafaro, DC. Cafaro, CA. Mendez, and J. Cerda, "New scheduling rule improves pipeline efficiency," Oil & Gas Journal, vol. 109, no.17, pp. 136-139, 2011.

[10] X. Yang, and G. Zhang, Design and management of oil products pipeline," Beijing: China University of Petroleum Press, 2005.

[11] G. Gong, and D. Yu, "Simulated calculation of hydraulic characteristics for batching operation," Oil & Gas Storage and

* Corresponding author. E-mail address: jxxkuaile@163.com

Tel.: +0086-15810788310; Fax: +0086-89733990

Transportation, vol. 11, no. 2, pp. 1-4, 1992.
[12] Y. Liang, and Z. Liu, "Optimal operation of multi-product pipeline network," Journal of China University of Petroleum, vol. 35, no. 3, pp. 115-118, 2011.