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Cost Optimal Selection of Storage Tanks in LPG Vaporization Station

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ABSTRACT

Liquefied petroleum gas (LPG) is an important urban gas source in China. Before supplied to customers by pipeline supply systems, LPG is stored in tanks in LPG vaporization stations. Designers usually decide the number and the size of storage tanks by their experience during constructions of vaporization stations. These decisions are usually not best and most economical. To solve the problem, a compact mixed integer nonlinear programming model has been developed in this paper. The objective is to minimize annual storage cost of the vaporization station. The model has been transformed into a general nonlinear programming model by transforming integer variables and 0-1 variables into continuous variables. One LPG vaporization station was taken as an example to illustrate the usage of the model. The results show that the optimal storage scheme can be determined accurately and quickly by the model and about 15% of storage cost can be saved every year after optimization.

KEYWORDS

Liquefied Petroleum Gas; Storage Tank; Cost Optimization; Mixed Integer Nonlinear Programming

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