Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science

Gas pipeline modelling and control

Vol 229, Issue 18, 2015

R Whalley, A Abdul-Ameer

First Published February 19, 2015 | Research Article
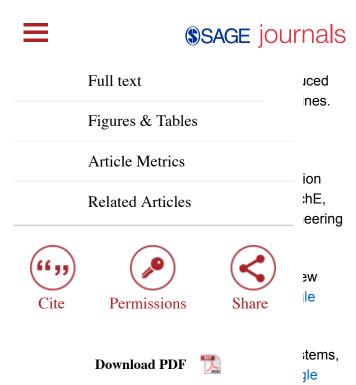
Table of Contents

Abstract

The distributed parameter modelling of the gas flow through long pipelines is considered. Procedures which incorporate the gas stream energy storage, the pipeline frictional resistance and pressure attenuation characteristics are introduced. The pipeline input–output, transfer function, pressure and volume flow representations are formulated. An optimum, least effort, closed loop regulation strategy is proposed. Frequency response techniques are invoked enabling the derivation of simple, robust control algorithms. Confirmation of the results

≡   **ⓈSAGE** journals   👤   🔍

Full text

Figures & Tables

Article Metrics

Related Articles

❝❞   **🔑**   **↗**
Cite   Permissions   Share

Download PDF 📄

3. Tabin J. *Natural gas compressor stations on the interstate pipeline network*. Washington: US Energy Information Office of Oil and Gas Report, 2007.

4. Hodder R. Screw compressors. *In:* Compressors and optimisation conf, Aberdeen, 2008. Google Scholar

5. Whalley R. Interconnected spatially distributed systems. Trans Inst 1990; 12: 260–271. Google Scholar

6. Suming WRZ, Rios-Mercado EAB, Scott LR. Model relaxations for the fuel cost minimisation of steady state gas pipeline networks. Math Comput Modelling 2000; 31: 197–220. Google Scholar

7. Menon ES. Gas pipeline hydraulics, Boca Raton, FL: Taylor and Francis, 2005. Google Scholar

8. Tentis E, Margaris D, Papanikas D. Transient gas flow using an adaptive

Full text

Figures & Tables

Article Metrics

Related Articles

Cite   Permissions   Share

Download PDF 📄

ns by
'1, pp.

es. *In:*
roup,
).

ution

ms.

–429.

12. Whalley R. The response of distributed-lumped parameter systems. Proc IMechE, Part C: J Mechanical Engineering Science 1988; 202: 421–429. Google Scholar Abstract

13. Whalley R, Ebrahimi KM. Multivariable system regulation. Proc IMechE, Part C: J Mechanical Engineering Science 2006; 220: 653–666. Google Scholar Abstract

14. Box GEP and Jenkins GM. *Time series analysis and forecasting and control*. San Francisco: Hadden-Day.

15. Lapedes A and Farber R. *How neural networks work*. Los Alamos Scientific Lab. LA-UR-88_413, 1987.

16. Yow W. *Analysis of transient flow in natural gas pipelines*. PhD Thesis, Univ. of Michigan, 1971.

17. Rachford HH, Dupont TA. A fast and highly accurate means of modelling

Full text　　　　　　　　　　uced
　　　　　　　　　　　　　　　nes.

Figures & Tables

Article Metrics　　　　　　　ion
　　　　　　　　　　　　　　hE,
Related Articles　　　　　　eering

Cite　　　　Permissions　　　　Share
　　　　　　　　　　　　　　　ew
　　　　　　　　　　　　　　　le

Download PDF 📄　　　　　　tems,
　　　　　　　　　　　　　　　gle

22. Takahashi Y. Control and dynamic systems, New York: Addison Wesley, 1970. Google Scholar

23. Palm WJ. System dynamics, New York: McGraw-Hill, 2005. Google Scholar

24. Robertson JA, Crowe CT. Engineering fluid mechanics, Boston: Houghton-Miffin, 1960. Google Scholar

25. Nichols NB. The linear properties of pneumatic transmission lines. In: *Inst. Soc. America, Joint Automatic Control Conference*, Boulder, 1961.

26. Brown FT. The transient response of fluid lines. ASME J Basic Eng 1962, pp. 547–553. Google Scholar

27. Modisette J and Modisette J. *Physics of pipeline flow*. Pipeline Simulation Interest Group, Energy Solutions International White Paper, 2003.

$SAGE journals

Full text

Figures & Tables

Article Metrics

Related Articles

Cite   Permissions   Share

Download PDF

The ultimate methods library

SAGE Stats
Data on Demand

CQ Library
American political resources

SAGE Recommends

≡   **⑤SAGE** journals   **👤**   **🔍**

Full text
Figures & Tables
Article Metrics
Related Articles

uthors
ditors
eviewers
brarians
esearchers
ocieties

Advertising
Reprints
Content
Sponsorships
Permissions

Cite   **Permissions**   **Share**

Download PDF

of Mechanical
Engineers, Part
C: Journal of
Mechanical
Engineering
Science

ISSN: 0954-4062

Online ISSN: 2041-2983

SAGE Recommends