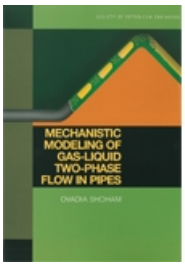

Mechanistic Modeling of Gas-Liquid Two-Phase Flow in Pipes

Ovadia Shoham

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408 pp.; Softcover
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Society of Petroleum
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★★★★★ (1 review)

1

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Description

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Reviews

The objectives of this book are twofold: to provide insight and understanding of two-phase flow phenomena and to develop analytical tools for either designing two-phase flow systems or conducting research in this area. The traditional approach for two-phase flow prediction was based on the development of an empirical correlation from experimental data. This book presents the recent approach, in which mathematical mechanistic models are developed, based on the physical phenomena, to predict two-phase flow behavior. The models can be verified and refined with limited experimental data. However, as these models incorporate the physical phenomena and the important flow variables, they can be extended to different operational conditions and can enable scaleup with significant confidence.

*The spreadsheet below replaces the CDROM originally included with purchase, and is also cited in the book.

Erata: http://www.spe.org/web/pubs/mech/

["Mechanistic Modeling of Gas-liquid Two-phase Flow in Pipes"] Insight And Understanding Of Two Phase Flow Phenomena by Ovadia Shoham. This Area. The Traditional Approach For Two-phase Flow Prediction Has Been The Empirical Approach, Which Was Based TYPE : PDF. Download Now. Home Â» Technology & Engineering Â» Two-Phase Flow, Boiling, and Condensation. ["Two-Phase Flow, Boiling, and Condensation"] Boiling And Condensation For Graduate Students Professionals by S. Mostafa Ghiaasiaan. Two-phase flow can be solid-liquid flow, liquid-liquid flow, gas-solid flow, and gas-liquid flow. Examples of solid-liquid flow include flow of corpuscles in the plasma, flow of mud, flow of liquid with suspended solids such as slurries, motion of liquid in aquifers.Â Sometimes, the term two-component is used to describe flows in which the phases do not consist of the same chemical substance.Â It is defined as the volumetric flow rate of gas phase (Q& g) divided by the pipe cross-sectional area (A). Ug. = Q& g A.Â (2010) used this dimensionless group in their dimensionless governing equations for heat transfer modeling of gasâ€“liquid slug flow without phase change in a micro tube. Convection Number (Co).

comprehensive mechanistic modeling of two-phase flow in vertical. pipes. More work is needed to develop models that describe the. physical phenomena more rigorously. The purpose of this study is to formulate a detailed comprehen-. sive mechanistic model for upward two-phase flow. The compre-. hensive model first predicts the existing flow pattern and then calcu Sample Header Text. Mechanistic Modeling of Gas-Liquid Two-Phase Flow in Pipes. Ovadia Shoham. 2006.Â The objectives of this book are twofold: to provide insight and understanding of two-phase flow phenomena and to develop analytical tools for either designing two-phase flow systems or conducting research in this area. The traditional approach for two-phase flow prediction was based on the development of an empirical correlation from experimental data. This book presents the recent approach, in which mathematical mechanistic models are developed, based on the physical phenomena, to predict two-phase flow behavior. The models can be verified and refined with limited experimental data. Two-phase ow of oil and gas is frequently encountered in production oil wells, not only in vertical and hor-izontal pipe segments but also in inclined pipes with several different angles. Besides that, sometimes gas is injected in the tubing in order to increase oil production rate. Therefore, it is of utmost importance to determine two-phase ow behaviour in pipes with every conceivable inclination and combination of mass fraction of each phase.Â Although mechanistic models for gas-liquid two-phase ow have been developed since the mid 1970â€™s (Zhang et al., 2003), there are still several recent developments.

Gasâ€“liquid two-phase ow in an annulus can be found in a variety of practical situations. In high rate oil and gas production, it may be benecial to ow uids vertically through the annulus conguration between well tubing and casing. The ow patterns in annuli are different from pipe ow.Â Later, a compre-hensive mechanistic model about heat transfer in gasâ€“liq-uid pipe ow was obtained (Manabe 2001). It was compared with the experimental data, and the performance was better. However, there were some inconsistencies in annular and slug ow. It needed to be modied. Zhang et al.Â persed-bubble ow; the subscript m represents the mixture properties of gas and liquid, A0b is the local parameter dened in Eq. (20). Equation (15) can be written as. Entrainment phenomenon in gas--liquid two-phase flow: A review. SaÂ¯dhanaÂ¯ Vol. 38, Part 6, December 2013, pp. 1173â€“1217. c Indian Academy of Sciences. Entrainment phenomenon in gasâ€“liquid two-phase ow: A review. R K BAGUL1,2, D S PILKHWAL1, P K VIJAYAN1,2 and J B JOSHI2,3,âˆ—.Â The gasâ€“liquid separation equipments are aimed to be designed for max-imum efciency of phase separation. In order to maximize their capacity the ow rates are required to be optimized for the capital cost of equipment.Â Ishii & Kataoka (1984) developed a detailed mechanistic model, taking into account various inuencing phe-nomena and parameters and produced a correlation for carryover which satised most of the experimental database available till the date. Original Title. Mechanistic Modeling of Gas-Liquid Two-phase Flow in Pipes. ISBN. 155563107X (ISBN13: 9781555631079).