INTERNATIONAL ISO/ASME

First edition
2015-04-01

Pump system energy assessment

Évaluation énergétique des systèmes de pompage

Reference number
ISO/ASME 14414:2015(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

ASME
Two Park Avenue • New York, NY 10016-5990 • USA
Tel. 800-843-2763
Fax 973-882-1717
E-mail CustomerCare@asme.org
Web www.asme.org

Published in Switzerland

Contents

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. www.iso.org/patents

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword - Supplementary information

ISO/ASME 14414 was prepared by ISO/TC 115, *Pumps,* in collaboration with ASME EA Standards Committee — *Industrial System Energy Assessment*.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This standard was developed under procedures accredited as meeting the criteria for American National Standards. The Standards Committee that approved the standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve", "rate", or "endorse" any item, construction, proprietary device, or activity. ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assumes any such liability. Users of a standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this standard.

ASME accepts responsibility for only those interpretations of designated documents issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals. ASME will not issue written interpretations of this edition of this standard.

ISO/ASME 14414 was approved as an American National Standard by the American National Standards Institute on 2015-02-06.

Introduction

Pumping systems account for a significant portion of a facility's energy consumption in many industries. In the majority of pumping systems the energy added to the working liquid by the pump is much greater than is required by the process. The excess energy added to the system (e.g. due to throttled control valve) increases heat, noise and vibration but also can bring the system's maintenance costs. The addition of excessive energy to the system often results in over-sizing piping system components such as pumps, process components, and control valves, resulting in an increase in capital costs.

This International Standard provides a method to assess pump systems, to identify and quantify pump system energy consumption reduction opportunities and reliability improvement opportunities. It gives a common definition for what constitutes an assessment for both users and providers of assessment services. Its objective is to provide clarity for these types of services which have been variously described as energy assessments, energy audits, energy surveys and energy studies.

In all cases, systems (energy-using logical groups of equipment organized to perform a specific function) are analysed through various techniques such as measurement, resulting in identification, documentation and prioritization of energy performance improvement opportunities.

When contracting for assessment services, facility personnel may use this International Standard to define and communicate their desired scope of assessment activity to third party contractors or consultants.

This International Standard is expected to contribute to decreased energy consumption and consequently to decreased carbon footprint.

This International Standard includes the required assessment report content in Annex A. It gives examples of efficient system operation and energy reduction opportunities in Annex B, information on competencies and experiences welcomed to perform audit in Annex C, guidelines for analysis software in Annex D, a typical example of pre-screening worksheet in Annex E, information on specific energy in Annex F, information on the concept of parasitic power in Annex G and examples of pumping system efficiency indicator in Annex H.

This International Standard is developed within the framework of ISO 50001, ISO 50002 and ISO 50003.