# ISO/ASME 14414:2015-04 (E)

## Pump system energy assessment

## Contents

Page


Foreword ..... v

Introduction ..... vi

1 Scope ..... 7

2 Normative references ..... 7

3 Termsanddefinitions ..... 8

4 Identificationoftheassessmentteam,authorityandfunctions ..... 8
4.1 Identification of assessment team functions ..... 8
4.2 Assessment team structure, leadership and competency ..... 9
4.3 Facility management support ..... 9
4.4 Communications ..... 9
4.5 Access to facilities, personnel and information ..... 9
4.6 Assessment objectives, scope and boundaries ..... 10
4.7 Action plan ..... 10
4.7.1 General ..... 10
4.7.2 Assessment scheduling ..... 11
4.8 Initial Data Collection and Evaluation ..... 11
4.8.1 General ..... 11
4.8.2 Initial facility specialist interviews ..... 11
4.8.3 Energy project history ..... 11
4.8.4 Energy cost ..... 11
4.8.5 Initial system data ..... 12
4.9 Objective check ..... 12

5 ConductingtheAssessment ..... 12
5.1 Assessment Levels ..... 12
5.1.1 General ..... 12
5.1.2 Level 1 assessments ..... 13
5.1.3 Level 2 assessments ..... 14
5.1.4 Level 3 Assessments ..... 14
5.2 Walk Through ..... 15
5.3 Understanding system functional requirements ..... 16
5.4 Determining system boundaries and system energy demand ..... 16
5.5 Information needed to assess the efficiency of a pumping system ..... 16
5.5.1 General ..... 16
5.5.2 Electrical motor/drive information ..... 16
5.5.3 Pump information ..... 17
5.5.4 Liquid properties information ..... 18
5.5.5 Detailed system data ..... 18
5.5.6 Measured data ..... 19
5.6 Data collection ..... 19
5.6.1 System information ..... 19
5.6.2 Measurement of pump and motor operating data ..... 20
5.6.3 Pressure ..... 20
5.6.4 Flow ..... 20
5.6.5 Input power ..... 20
5.7 Cross validation ..... 21
5.8 Wrap-up meeting and presentation of initial findings and recommendations ..... 21

6 Reporting and documentation ..... 21
6.1 Final assessment report ..... 21
6.2 Data for third party review ..... 21
6.3 Review of final report by assessment team members ..... 22

Annex A (normative) Report ..... 23

Annex B (informative)Recommendationsonefficientsystemoperationandenergy reduction - Examples ..... 27

Annex C (informative)Expertise,experienceandcompetencies ..... 45

Annex D (informative) Recommended guidelines for analysis software ..... 48

Annex E (informative)Exampleofprescreeningworksheet ..... 50

Annex F (informative)SpecificEnergy ..... 51

Annex G (informative) Pumping system parasitic power ..... 55

Annex H (informative)Exampleofpumpingsystemefficiencyindicator ..... 58

Bibliography ..... 61