



BSI Standards Publication

**Petroleum, petrochemical and natural gas
industries — Calculation and reporting
production efficiency in the operating phase**

National foreword

This Published Document is the UK implementation of ISO/TS 3250:2021.

The UK participation in its preparation was entrusted to Technical Committee PSE/17/67, ISO/TC 67 Management Committee.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2021
Published by BSI Standards Limited 2021

ISBN 978 0 539 1430 6

ICS 75.020

Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 September 2021.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

TECHNICAL
SPECIFICATION

ISO/TS
3250

First edition
2021-08-31

**Petroleum, petrochemical and natural
gas industries — Calculation and
reporting production efficiency in the
operating phase**

*Industries du pétrole, de la pétrochimie et du gaz naturel — Calcul et
rapport d'efficacité de la production dans la phase d'exploitation*



Reference number
ISO/TS 3250:2021(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021. Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	1
3.1 Terms and definitions.....	1
3.2 Abbreviations.....	13
4 Application	15
4.1 Users of this document.....	15
4.2 Framework conditions.....	15
4.2.1 General.....	15
4.2.2 Quality assurance.....	17
4.2.3 HSE considerations.....	17
4.2.4 Sustainability and climate change considerations.....	18
4.3 Business category.....	18
4.4 Overview of PE calculation and reporting work process.....	19
4.5 Limitations.....	20
4.6 PE data exchange between operators in benchmarking.....	21
5 Performance measures	21
5.1 General.....	21
5.2 Production efficiency.....	21
5.2.1 PE forecasting.....	21
5.2.2 PE calculation and reporting.....	22
5.2.3 Initial production performance.....	22
5.3 PE measurement.....	23
5.4 PE calculation methodology.....	23
5.4.1 PE calculation formula.....	23
5.4.2 PE boundary conditions and reporting period.....	24
5.5 Injection efficiency calculation formula.....	24
6 Production	25
6.1 General.....	25
6.2 Material balance.....	25
6.3 Export – measured product.....	26
6.4 Conversion factors for oil equivalents.....	27
6.5 Injection.....	27
6.6 Disposal – general.....	27
6.7 Disposal – flaring or venting of large volumes.....	27
6.7.1 Production facilities with a gas export route (to sales).....	27
6.7.2 Production facilities with a gas injection route only.....	27
6.7.3 Production facilities with no gas export route or other gas disposal routes.....	28
6.7.4 Flaring restrictions.....	28
6.8 Disposal – venting of small volumes.....	28
6.9 Fuel 28.....	28
6.10 Import.....	28
6.11 Artificial lift.....	29
7 Production potential	29
7.1 General.....	29
7.2 Methods for determination of production potential.....	29
7.3 Structural maximum production potential (Method A).....	29
7.4 Achieved production potential (Method B).....	31
7.5 Differences between Method A and Method B.....	31
7.6 Adjusting the production potential.....	32

7.7	Schedule delays	34
7.8	Injection potential	35
8	Production loss categories	36
8.1	General	36
8.2	Planned and unplanned events	36
8.3	Turnaround	36
8.4	Modification	37
8.5	Pre-production	37
8.6	Flaring and venting of gas	37
8.7	Injection	37
8.8	Accounting period	38
Annex A (normative) Production loss categorization		39
Annex B (informative) Performance measures for production availability		53
Annex C (normative) Taxonomy classification		56
Annex D (informative) Production loss subdivision with respect to system and equipment class		57
Annex E (informative) Examples		63
Bibliography		75

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 (see 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 (see 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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The petroleum, petrochemical and natural gas industries involve large capital expenditure as well as operating expenditure. Revenue loss caused by production loss will affect the profitability of such industry and for a specific plant operatorship.

Production efficiency (PE) is a term often used by operators for historic production availability in the operating phase. PE is a reported measure, and it can be compared with the predicted (or targeted) production availability made during a project development stage. Furthermore, PE is forecasted and tracked during the operating phase to allow tracking of performance. ISO 20815:2018 addresses production assurance activities including analytical methods for predicting production availability, and also includes a production loss categorization.

This document supports this production loss categorization with a harmonized approach for calculating and reporting production loss and production efficiency in the operating phase, including forecasting during this life cycle phase. This will enable precise and consistent feedback of production performance for use in production and operational planning to achieve optimal PE for the operator and associated industry stakeholders. Focus is given to actual produced volume and reference production volume, e.g. production potential that will depend on reservoir and well constraints, plant/process constraints, export/transportation constraints and market constraints. Standardization of PE reporting across the industry will drive consistency and provide better quality PE information and communication for operators and partners.

Petroleum, petrochemical and natural gas industries — Calculation and reporting production efficiency in the operating phase

1 Scope

This document provides requirements and guidance for reporting of production performance data and production loss data in the operating phase by use of production loss categorization. It supplements the principles of ISO 20815:2018, Clause E.3 and Annex G by providing additional details.

This document focusses on installations and asset elements within the upstream business category. Business categories and associated installations and plants/units, systems and equipment classes are used in line with ISO 14224:2016, Annex A.

The production loss categories given in [Annex A](#) are given at a high taxonomic level and supplements the reporting of failure and maintenance parameters as defined in ISO 14224:2016, Annex B.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14224:2016, *Petroleum, petrochemical and natural gas industries — Collection and exchange of reliability and maintenance data for equipment*

ISO 20815:2018, *Petroleum, petrochemical and natural gas industries — Production assurance and reliability management*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 Terms and definitions

3.1.1 Achieved production potential

production potential (3.1.43) that in retrospect can be verified as the maximum achievable production in a given time period

Note 1 to entry: Achieved production potential is the sum of the achieved production and the estimated *production loss* (3.1.40) occurring in the four production potential elements: *well production potential* (3.1.58), *plant production capacity* (3.1.34), *export capacity* (3.1.12) and *market potential* (3.1.26).

Note 2 to entry: Achieved production potential can vary over time.