

# ISO 20815:2018 (E)

## Petroleum, petrochemical and natural gas industries — Production assurance and reliability management

---

### Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms, definitions and abbreviated terms
3.1	Terms and definitions
3.2	Abbreviations
4	Production assurance and decision support
4.1	Users of this document
4.2	Framework conditions
4.3	Optimization process
4.4	Production assurance programme
4.4.1	Objectives
4.4.2	Project risk categorization
4.4.3	Programme activities
4.5	Alternative standards
5	Production assurance processes and activities
Annex A	(informative) Contents of production assurance programme (PAP)
A.1	General
A.2	Title
A.3	Terms of reference
A.4	Production assurance philosophy and performance objectives
A.5	Project risk categorization
A.6	Organization and responsibilities
A.7	Activity schedule
A.8	References
Annex B	(informative) Core production assurance processes and activities
B.1	Production assurance requirements — Process 1
B.2	Production assurance planning — Process 2
B.3	Design and manufacture for production assurance — Process 3
B.4	Production assurance — Process 4
B.5	Risk and reliability analysis — Process 5
B.6	Verification and validation — Process 6
B.7	Performance data tracking and analysis — Process 9
Annex C	(informative) Interacting production assurance processes and activities
C.1	General
C.2	Project risk management — Process 7
C.3	Qualification and testing — Process 8
C.4	Supply chain management — Process 10
C.5	Management of change — Process 11
C.6	Organizational learning — Process 12
Annex D	(informative) Production performance analyses
D.1	General

- D.2 Planning
- D.2.1 Objectives
- D.2.2 Production performance analysis information
- D.3 Procedure
- D.3.1 Preparation
- D.3.2 Study basis
- D.3.3 Model development
- D.3.4 Analysis and assessment
- D.3.4.1 Performance measures
- D.3.4.2 Sensitivity analyses
- D.3.4.3 Importance measures
- D.3.5 Reporting and recommendations
- D.3.6 Major accidents and rare long duration events
- D.3.7 Handling of uncertainty

**Annex E (informative) Reliability and production performance data**

- E.1 Collection of reliability data
- E.1.1 General
- E.1.2 Equipment boundary and hierarchy definition
- E.1.3 Data analysis
- E.2 Qualification and application of reliability data
- E.3 Production performance data

**Annex F (informative) Performance objectives and requirements**

- F.1 General
- F.2 Specifying production assurance
- F.3 Verification of requirement fulfilment
- F.4 Safety and environmental considerations

**Annex G (informative) Performance measures for production availability**

- G.1 General
- G.2 Production availability
- G.2.1 Volume-based performance measures
- G.2.2 Contracted volume
- G.2.3 Design capacity
- G.2.4 Well-production potential
- G.2.5 Planned production volume assuming no down time (planned or unplanned)
- G.2.6 Planned production volume
- G.2.7 Time-based performance measures
- G.3 Production and time loss categories

**Annex H (informative) Relationship to major accidents**

- H.1 General
- H.2 Criterion for attention in analyses

**Annex I (informative) Outline of techniques**

- I.1 General
- I.2 Failure modes and effects analysis
- I.3 Fault tree analysis
- I.4 Reliability block diagram
- I.5 Models for production availability calculations
- I.5.1 General
- I.5.2 Monte-Carlo simulation principles
- I.5.3 Behavioural modelling
- I.5.4 Flow network analysis
- I.5.5 Petri net analysis
- I.6 Design reviews
- I.7 Hazard and operability study
- I.8 Performance and operability review
- I.9 Reliability testing
- I.9.1 General
- I.9.2 Overview of testing activities
- I.10 Human factors
- I.11 Software reliability

- I.12 Dependent, common cause and common mode failures
- I.13 Life data analysis
- I.14 Reliability-centred maintenance analysis
- I.15 Risk-based inspection analysis
- I.16 Test interval optimization
- I.17 Spare parts optimization
- I.18 Methods of structural reliability analysis
- I.19 Life cycle cost analysis
- I.20 Risk and emergency preparedness analyses
- I.21 Technology maturity assessment
  - I.21.1 General
  - I.21.2 Technology readiness level
  - I.21.3 Technology novelty category
- I.22 Markov process analysis
- I.23 Bayesian belief network
- I.24 Life time extension analysis
- I.25 Analysis on weather influence on production performance
- I.26 Loading performance analysis

Page count: 99