

# New edition of NORSOK P-002:2023 Process system design

NORSOK P-002 EG-P

2023-01-17





# NORSOK P-002:2023

NORSOK P-002:2023 Process system design, edition 2, was published in January 2023.

It specifies requirements and guidelines for most frequently used process-, process support- and utility systems on offshore production facilities.

The following aspects of topside process piping and equipment design are covered:

- design pressure and temperature,
- process safety system design,
- line sizing,
- system and equipment isolation,
- insulation and heat tracing.

Additionally, NORSOK P-002 defines the minimum functional requirements for process systems on an offshore installation and includes several recommendations to give additional guidance for the system design



# NORSOK P-002:2023

NORSOK P-002 was last updated in August 2014 and needed an update.

Its content is still relevant for the Oil and Gas industry on the Norwegian Continental Shelf.

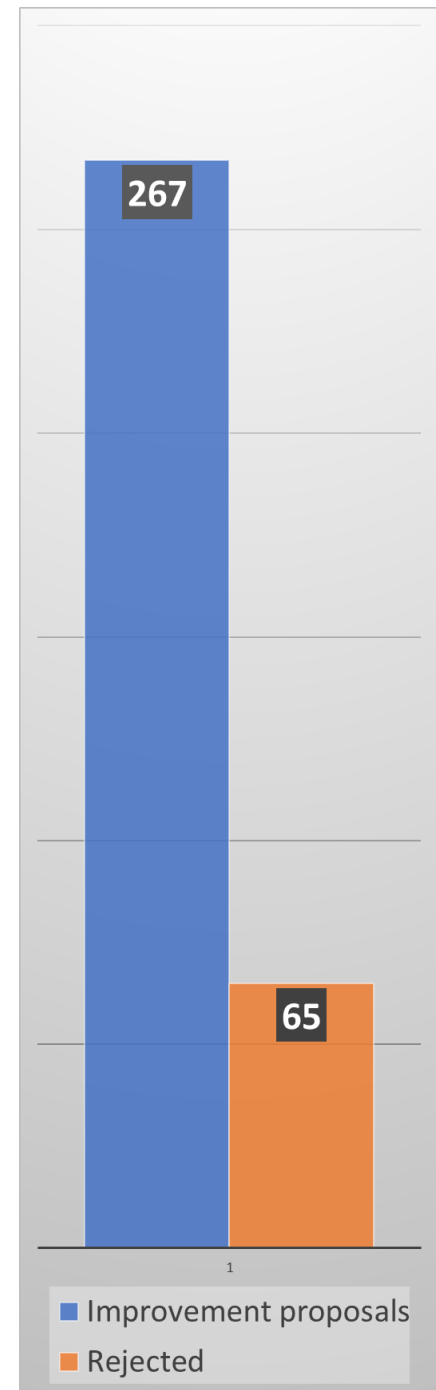
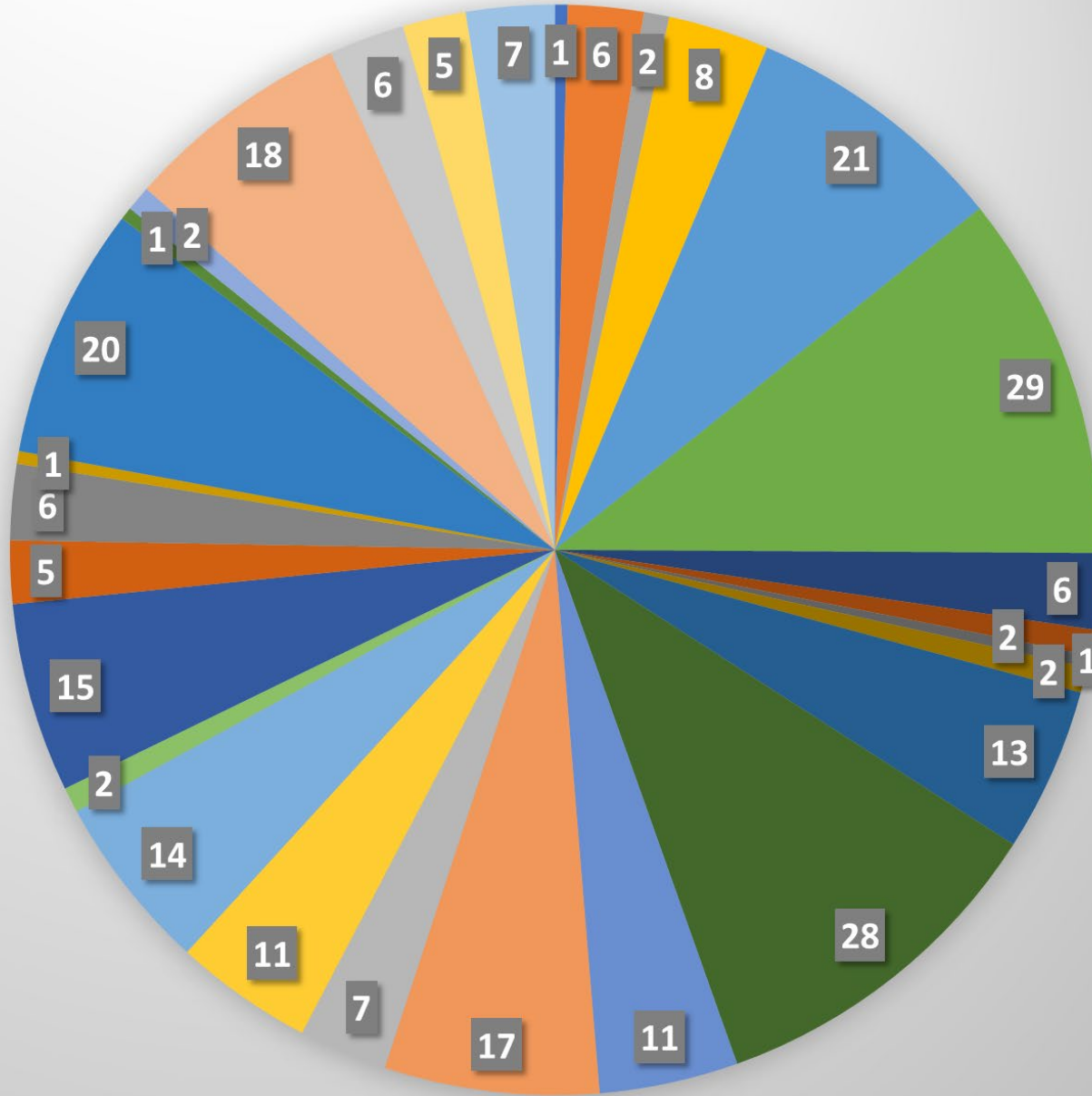
NORSOK analysis' recommendations have been taken into account for the update, e.g.:

- Parts of the standard should be integrated into international standards
  - Remove overlapping content related to process safety and process design from the normative section of the standard where this is adequately covered by industry and international standards (API 520/521, API 12J, API 14C and IOGP standards).
  - Content that is proposed due to lack of knowledge about topics covered by international standards should not be included.
- Implement relevant consolidated company standards, practice and experience into P-002 to reduce number of company specific requirements (consensus driven).
- Ensure transferral of important HSE learnings on the Norwegian Continental Shelf
- An updated process standard contributes to more standardized requirements and implementation in the value chain, including operators, suppliers and engineering companies. This gives an efficiency gain in projects and operations.
- Requests for new content without a text proposal that the committee can consider should be rejected.
  - For reasons of progress, a committee cannot start formulating new content without a concrete text proposal.

## Distribution of improvement proposals to Norsok P002



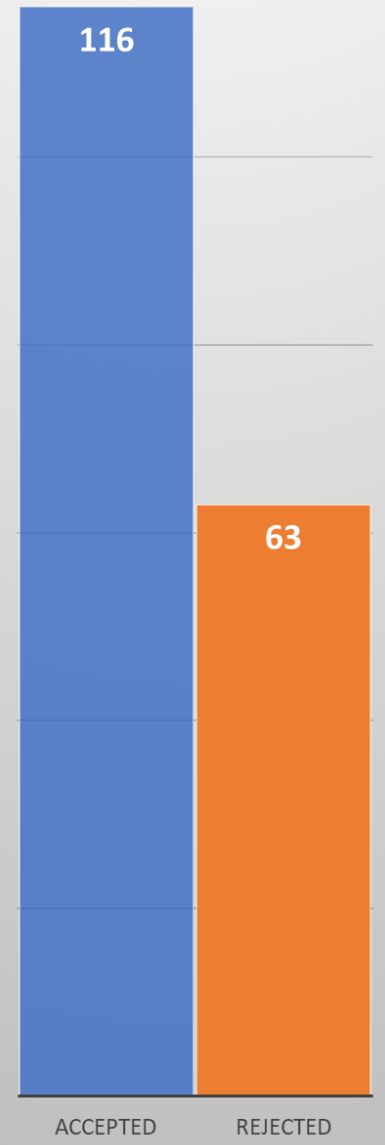
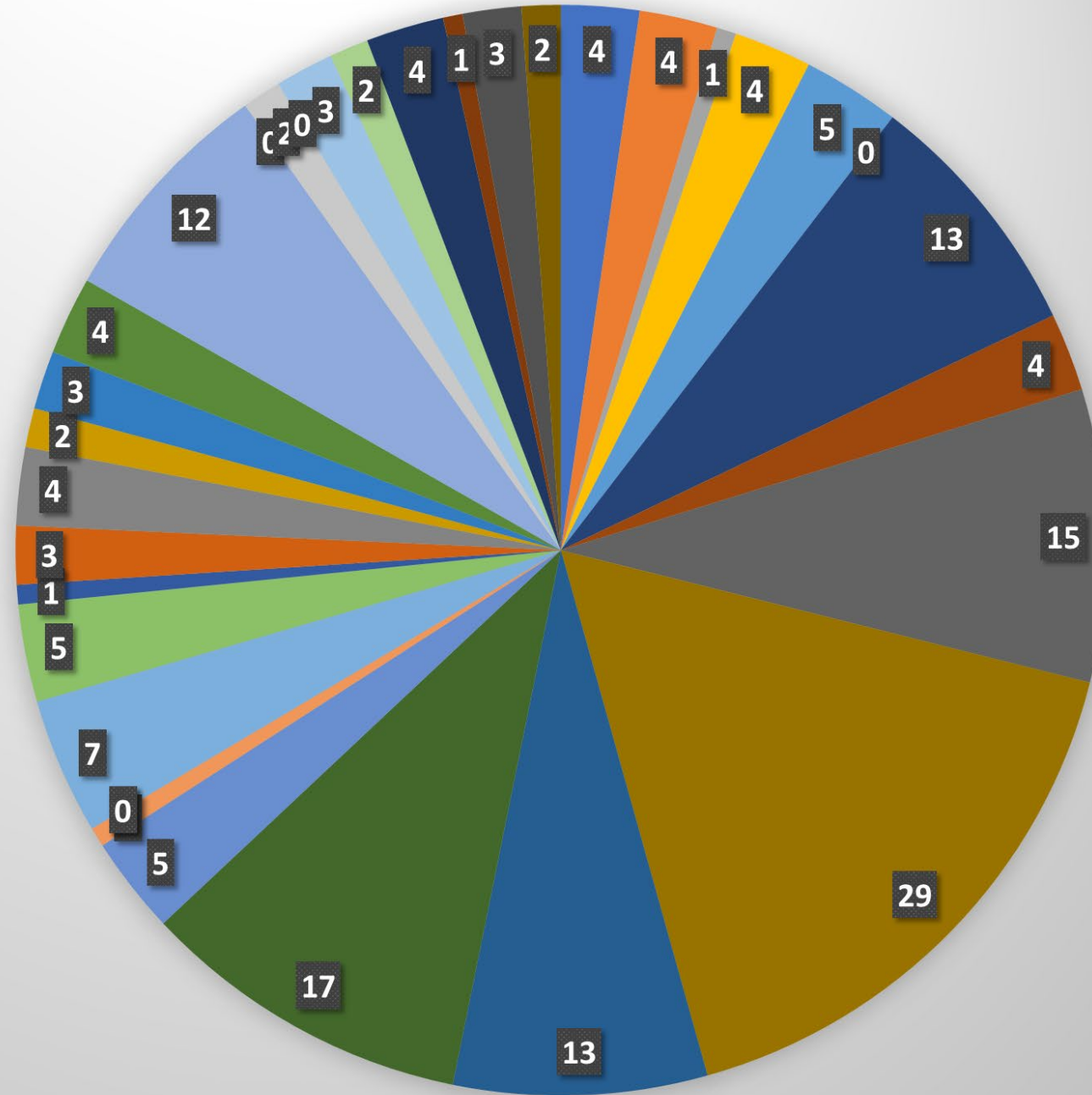
- 3 Terms, definitions and abbreviations
- 4 Design pressure and temperature
- 5 General system design
- 6 Safety requirements
- 7 Line sizing criteria
- 8 General process equipment design
- 9 Detailed requirements for system and equipment isolation
- 10 Insulation and heat tracing of piping and equipment
- 11 Topside flow lines and maifolds (system 13)
- 12 Seperation and stabilisation (system 20)
- 14 Gas compression (systems 23, 26 and 27)
- 15 Gas treatment (system 24)
- 16 Gas conditioning (system 25)
- 17 Water injection (system 29)
- 18 Cooling medium (system 40)
- 19 Heating medium (system 41)
- 20 Chemical injection (system 42)
- 21 Flare and vent (system 43)
- 22 Oily water treatment (system 44)
- 23 Fuel gas (system 45)
- 24 Methanol injection(system 46)
- 25 Chlorination (system 47)
- 26 Sea water (system 50)
- 27 Fresh water (system 53)
- 28 Open drain(system 56)
- 30 Diesel oil (system 62)
- 31 Compressed air (system 63)
- 32 Inert gas (system 64)
- 33 Hydraulic power (system 65)



■ Improvement proposals  
 ■ Rejected

## Distribution of comments on draft version of NORSOK P-002 per clause

- 1 Scope
- 2 Normative references
- 3 Terms, definitions and abbreviations
- 4 Abbreviations
- 5 Design pressure and temperature
- 6 General system design
- 7 Safety requirements
- 8 Line sizing criteria
- 9 General process equipment design
- 10 Detailed requirements for system and equipment isolation
- 11 Insulation and heat tracing of piping and equipment
- 12 Topside flow lines and maifolds (system 13)
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## **Outline of changes to Norsok P-002:2023**

- The document has been updated to reflect current industry practice and relevant international standards.
- Methodology for line-sizing of gas and two-phase flow has been updated.
- Issued in a digital format enabling machine reading of requirements.
- As part of digitalization of requirements, more precise wording and reduced requirement ambiguity have been implemented.
- Background information, guidelines and examples have been included where relevant for new and revised sections.



# Highlight of changes to Norsok P-002:2023

- General:
  - Focus on reducing risk of hydrocarbon exposure during maintenance and sampling.
  - Additional requirements for sampling possibilities.
  - Reference to ISO 23251 removed.
  - Recommendations on providing instrumentation for condition monitoring.
- Clause 7:
  - Safety Instrumented Secondary Protection section updated.
  - Safety Instrumented Functions response time requirements.
- Clause 8:
  - Line sizing of gas and multiphase lines, using Energy Institute's AVIFF guideline replaces old "rule of thumb" equation which was non-conservative.
- Requirement to use actual sand production estimate for erosion evaluations and design shall consider failure of sand control completions.
- Stricter Froude number guidance on smaller diameter vertical dump lines
- Clause 9:
  - Several updates to separator and scrubber design
- Clause 10:
  - Clarification of terms "Double block and bleed" functionality vs. "Double isolation and bleed" valve design as defined in API 6D.



# Highlight of changes to Norsok P-002:2023

- Clause 11:
  - Use of increased wall thickness as alternative to PFP.
  - More precise requirements for Safety-critical heat conservation
- Clause 14:
  - Revised guidelines for design pressure evaluations for compression systems
  - Requirement for protection against compressor overload added.
- Clause 18/23:
  - Significant updated based on new knowledge
- Clause 25:
  - MEG included together with methanol.
- Clause 26:
  - Recommended residual hypochlorite concentration is increased to 0,3 – 0,7 (from 0,2 – 0,5)
- Clause 28:
  - New Offshore potable water standard is under development (Norsok P-003).
- Clause 29:
  - Guidance on capacity of open drain system to avoid backflow between fire areas.
- Clause 32:
  - Revised guidance on connection of air compressor to emergency generator to reduce load on emergency generator
- Clause 33:
  - N2 consumer criticality classification required





## Additional information

The Norsok P-002:2023 standard was revised by the process expert group [Norsok EG-P](#).

Improvement proposals can be given by e-mail to [petroleum@standard.no](mailto:petroleum@standard.no)

- For standards 3 years or less, corrigendum shall be issued. For older standards, the standard shall be revised.

For questions regarding this standard, welcome to contact Team Energy and Petroleum at Standards Norway: [petroleum@standard.no](mailto:petroleum@standard.no).



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