**IS XXXX : 2024**

***भारतीय मानक***

***Indian Standard***

 **ISO 19014-4 : 2020**

**भू-संचलन मशीनरी — कार्यात्मक सुरक्षा**

**भाग 4 नियंत्रण पद्धति के सुरक्षा संबंधी सॉफ्टवेयर एवं डेटा ट्रांसमिशन के डिजाइन एवं मूल्यांकन**

**Earth-Moving Machinery — Functional Safety**

**Part 4 Design and Evaluation of Software and Data Transmission for Safety-Related Parts of the Control System**

ICS 53.100

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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**November 2024 Price Group X**

Earth Moving Equipment and Material Handling Sectional Committee, MED 07

NATIONAL FOREWORD

This Indian Standard (Part 4), which is identical with ISO 19014-4 : 2020 ‘Earth-Moving Machinery — Functional Safety — Part 4 Design And Evaluation Of Software And Data Transmission For Safety-Related Parts Of The Control System’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on recommendation of the Earth Moving Equipment and Material Handling Sectional Committee and approval of the Mechanical Engineering Division Council.

The text of ISO standard is proposed for publication as an Indian Standard without deviations. Certain terminologies and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

1. Wherever the words ‘International Standard’ appear referring to this standard, they

should be read as ‘Indian Standard’.

1. Comma (,) has been used as a decimal marker, while in Indian Standards, the current

practice is to use a point (.) as the decimal marker.

Under the general title ‘Earth-Moving Machinery — Functional Safety’, the other parts are as following:

|  |  |
| --- | --- |
| Part 2 | Design and evaluation of hardware and architecture requirements for safety-related parts of the control system (*Under Process*) |
| Part 5 | Tables of performance levels (*Under Process*) |

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standard, which are to be substituted in their respective place, are listed below along with their degree of equivalence for the editions indicated:

|  |  |  |
| --- | --- | --- |
| *International Standard* | *Corresponding Indian Standard* | *Degree of Equivalence* |
| ISO 6750-1, Earth-moving machinery — Operator's manual — Part 1: Contents and format | IS/ISO 6750-1 : 2019, Earth-Moving Machinery — Operator's manual Part 1 Contents and Format (first revision) | *Identical* |
| ISO 12100, Safety of machinery — General principles for design — Risk assessment and risk reduction | IS 16819 : 2018 / ISO 12100:2010, Safety of machinery — General principles for design – Risk assessment and risk reduction | *Identical* |
| ISO 13849-1, Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design | IS 16810 (Part 1) : 2018 / ISO 13849-1:2015, Safety of machinery — Safety related parts of control systems: Part 1 general principles for design | *Identical* |
| ISO 19014-1, Earth-moving machinery — Functional safety — Part 1: Methodology to determine safety-related parts of the control system and performance requirements | IS/ISO 19014-1 : 2018, Earth-Moving Machinery — Functional Safety Part 1 Methodology to Determine Safety-related Parts of the Control System and Performance Requirements | *Identical* |

The technical committee has reviewed the provision of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

|  |  |
| --- | --- |
| *International Standard* | *Title* |
| ISO 19014-2  | Earth-moving machinery — Functional safety — Part 2: Design and evaluation of hardware and architecture requirements for safety-related parts of the control system |

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded-off value should be the same as that of the specified value in this standard.