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AN INDUSTRY STANDARD FOR FLUID POWER

**Fluid power systems and components –
Reliability analysis, field data reporting format
and database compilation**

**(Revision of NFPA T2.12.11-1, R1-2009)
Reaffirmed 2019**

Descriptors: fluid power systems components reliability analysis reporting format database compilation recommended practice maintainability availability controlled studies

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6737 W. Washington St., Suite 2350 / Milwaukee, WI 53214 USA
PHONE: +1 414 778 3344 / FAX: +1 414 778 3361 / E-mail: nfpa@nfpa.com

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Foreword

This foreword is not part of National Fluid Power Association Recommended Practice *Fluid power systems and components – Reliability analysis, field data reporting format and database compilation*, NFPA/T2.12.11-1 R1-2009.

Five years after the publication of NFPA/T2.12.11-1-2001, NFPA/T2.12 agreed to revise the document. Tom Wanke and John Montague agreed to serve again as project co-chairs. The Title, Scope and Purpose (TSP) was approved at the 11 January 2007 NFPA Technical Board meeting. Drafts no. 1 and 2 of the document were discussed at joint meetings of NFPA/T2.12 and U.S. TAG SC 8 on 14 February 2007 and 16 May 2007, respectively. At the 20 September 2007 meeting, draft no. 3, which incorporated a number changes, was discussed, and a motion was approved to circulate the document for general review.

NFPA/T2.12.11-1 R1-200x was circulated for general review on 28 November 2007 and closed on 28 December 2007. At the 12 June 2008 meeting, the committee reviewed the comments from the general review, which were satisfactorily resolved and the resulting changes were incorporated into the document. At the same meeting, NFPA/T2.12 approved a motion to circulate the document for final ballot. On 14 August 2008, the NFPA Technical Board gave its approval for final ballot.

The document was circulated for final ballot on 25 November 2008 and closed on 26 December 2008. The voting resulted in 20 approval votes, zero disapproval votes and one abstention, and all comments were satisfactorily resolved. At the 12 February 2009 joint meeting of NFPA/T2.12 and U.S. TAG SC 8, a motion was approved to ask the NFPA Technical Board for permission to publish the document. At its 2 April 2009 meeting, the NFPA Technical Board gave its permission to publish the document.

Project Group Members who developed this recommended practice:

John Montague

Project Co-Chair
Consultant

Thomas Wanke

Project Co-Chair
Testing Technology Committee Chair
Milwaukee School of Engineering

John Berninger

Parker Hannifin Corp.

Eugene Cottle*

Bosch Rexroth Corp.

John Kaufman

Caterpillar, Inc.

Chuck Meinke

Bosch Rexroth Corp.

James F. Simpson*

SMC Corporation

John F. Walrad

Consultant

Carrie Tatman Schwartz

Industry/National Standards Development
Manager
National Fluid Power Association

*No longer with company
/cts

This is a preview of "NFPA/T2.12.11-1 R1-2...". [Click here to purchase the full version from the ANSI store.](#)

Introduction

In fluid power systems, power is transmitted and controlled through a liquid or gas under pressure within an enclosed circuit. Fluid power systems comprise a number of components and are an integral subsystem of various machines and equipment. Efficient and economic production requires highly reliable machines and equipment.

Collection of field reliability data is an essential element of an effective product reliability program. It is one of the most valuable sources of data since it represents actual customer/user product experience under real world conditions.

In a broad perspective, reliability is associated with dependability and availability, successful operation and performance, and the absence of breakdowns or failures. Failure occurs because of manufacturing defects, misapplication of product, inadequate maintenance, cumulative wear and degradation, design deficiencies and random chance.

The collection of field reliability data provides a measure of product quality over time and end user experience.

Fluid power systems and components – Reliability analysis, field data reporting format and database compilation

1 Scope

1.1 This recommended practice includes guidelines for the collection of data relating to reliability, maintainability, availability and maintenance of fluid power components and systems operating in the field.

1.2 This recommended practice is intended to:

- provide guidance for collecting field reliability data in controlled studies of reliability; and
- provide guidance for analysis and presentation of field reliability data.

2 Normative references

The following standards contain provisions, which, through reference in this test, constitute provisions of this NFPA document. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this NFPA document are encouraged to investigate the possibility of applying the most recent editions of the documents listed below. NFPA maintains registers of currently valid NFPA/ANSI, IEC, and ISO standards.

IEC 60300-3-2 (latest edition), *Dependability management – Part 3: Application guide – Section 2: Collection of dependability data from the field.*

IEC 60050-581 (latest edition), *International electrotechnical vocabulary* (Chapter 191: Dependability and quality of service).

IEC 60605-6 (latest edition), *Equipment reliability testing – Part 6: Tests for the validity and estimation of the constant failure rate and constant failure intensity.*

ISO 5598 (latest edition), *Fluid power systems and components – Vocabulary.*

ISO 4406 (latest edition), *Hydraulic fluid power – Fluids – Method for coding the level of contamination by solid particles.*

ISO 8258 (latest edition), *Shewhart control charts.*

3 Definitions

For the purposes of this recommended practice, the terms and definitions given in ISO 5598, IEC 60050-581 and the following apply:

3.1 reliability: probability that machinery/equipment can perform continuously, without failure, for a specified interval of time when operating under stated conditions.