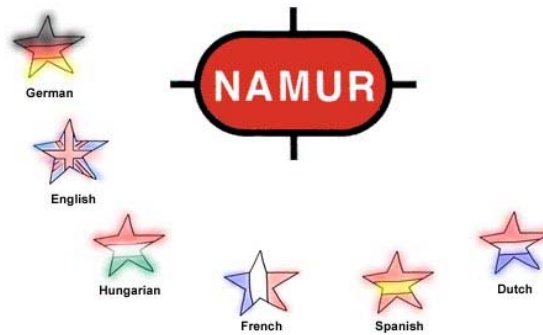




NAMUR

This white paper defines NAMUR and explains the DeltaV system's application of its guidelines.



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Contents

Introduction	3
Application of NAMUR Guidelines in the DeltaV System	3
NAMUR Limit Detection	3
Example NAMUR NE 21	3
Standards/specification cited	4
Industry Standards and Directives used by the DeltaV System	4
Industry Guidelines used by the DeltaV System.....	5
Background on NAMUR	6
History	6
Former Activities	6
Activities Today	6
Objectives	6
Working Results.....	6
Exchange of Experience	7
Requirements.....	7
Co-operation	7
Members	8
Germany	8
Austria.....	11
Switzerland.....	11
Netherlands.....	11
Belgium	11
Hungary.....	12
Spain	13
Publications	13
NAMUR Recommendations and Worksheets.....	13



Introduction

The DeltaV system open architecture encompasses industry standards and guidelines and state-of-the-art technology. Please refer to the *Standards and Technologies* whitepaper for details on the industry standards, various technologies, and industry guidelines together with where they are used in the DeltaV system. Where appropriate, the DeltaV system applies international standards as opposed to industry or trade group recommendations. This approach is consistent with NAMUR, as the published NAMUR recommendations are not intended to be viewed as standards or guidelines. In this paper we will give a brief outline of the areas of the DeltaV system that may be influenced by NAMUR guidelines, followed by a background on NAMUR. The information on NAMUR is obtained from their web site. (http://www.namur.de/en/organ_d11.html)

Application of NAMUR Guidelines in the DeltaV System

NAMUR guidelines apply directly in several areas of the DeltaV system. The first is NAMUR NE33 31.03.1993: "Requirements to be met by systems for recipe-based operations." This guideline is evident in the implementation of Recipe Studio, which also conforms to the ISA SP88 standard. In the DeltaV I/O area NAMUR alarming applies to analog signals (see *below*) and additionally the I.S. DI card is designed to be compatible with NAMUR sensors (to DIN 19234). In addition, the DeltaV system conforms to many of the standards that are referenced in the NAMUR guidelines. We will examine the example of NAMUR NE 21 below.

NAMUR Limit Detection

You can enable NAMUR limit detection for the analog input value by configuring the I/O channel properties NAMUR_ENA parameter. When this feature is enabled (TRUE) and the IO_IN type is FIELD_VAL_PCT or HART_FIELD_VAL, the status of the input is set to **Bad** if the signal level is above 21 mA or below 3.6 mA for more than four seconds. The **Bad** status is cleared when the signal returns within these limits. You can use this feature when the transmitter is designed to flag a device failure by setting its current signal outside the normal 4-20 mA range.

Example NAMUR NE 21

NAMUR NE 21 - Electromagnetic compatibility(EMC) of industrial process and laboratory control equipment.

This document is prefaced with the following comment as to scope of application - "NAMUR recommendations and worksheets are working documents and practical reports prepared by NAMUR for their members. Their application is optional. The papers are neither normative standards nor guidelines." Commentary on this recommendation shall be made with this scope in mind.

NE 21 is a uniform and practical way of determining whether the devices used in process control are immune to interference. It also includes references to national, international and drafts of standards. NE 21 requires testing to a series of standards, some of which are not yet mandatory in Europe. The current EMC standard (EN 61326) covers most of the requirements referenced in NE21.

Currently, the DeltaV system is compliant with EN 61326, but parts of the system do not meet the additional requirements of NAMUR NE21. In addition, the DeltaV system meets the standards with acceptance criteria appropriate for a system under "continuous unmonitored operation." Namur NE 21 can be interpreted to define the acceptance criteria as would be appropriate for "essential operation (functional safety)" under the EN standard. With the new redundant-capable I/O cards targeted for use in SIS applications, along with new versions of the MD Controller and Dual DC/DC System Supply, the DeltaV system meets the more stringent acceptance criteria



appropriate for “essential operation(functional safety)” as required by IEC 61326 , and thus meets this interpretation of the requirement of NE21.

The goal is to meet the mandatory requirements of applicable EN standards and any other applicable international standards, with NAMUR NE 21 (and others) as a secondary goal due to their stated purpose of being “neither standards or guidelines.”

Immunity standards for EN 61326:

EN 61000-4-2	ESD
EN 61000-4-3	Electromagnetic Fields
EN 61000-4-4	EFT
EN 61000-4-5	Surge
EN 61000-4-6	Conducted RF
EN 61000-4-8	Magnetic Fields
EN 61000-4-11	Voltage Dips & Dropouts

Additional standards for NE 21:

EN 61000-4-16	Common Mode Disturbances
EN 61000-4-17	Ripple on DC Power

Standards/specification cited

DIN V ENV 50140; VDE 0847 Part 3 1995.02
DIN V ENV 50204; VDE V 0847 Part 204 1996.02
DIN EN 61000-4-2; VDE 0847 Part 4-2 1996.03
DIN EN 61000-4-4; VDE 0847 Part 4-4 1996.03
DIN EN 61000-4-5; VDE 0847 Part 4-5 1996.09
DIN EN 61000-4-6; VDE 0847 Part 4-6 1997.04
DIN EN 61000-4-8; VDE 0847 Part 4-8 1994.05
DIN EN 61000-4-11; VDE 0847 Part 4-11 1995.04
DIN IEC 77A/156/CD; VDE 0847 Part 4-17 1997.04
DIN IEC 77A/120/CD; VDE 0847 Part 4-16 1995.05
DIN IEC 77B/193/CDV; VDE 0847 Part 4-4/A1 1996.10
DIN IEC 77B/180/CDV; VDE 0847 Part 4-2/A1 1996.10
DIN VDE 0870-1
DIN 1319
DIN 40110

Industry Standards and Directives used by the DeltaV System

73/23/EEC Low Voltage Directive
89/336/EEC EMC Directive
94/9/EC ATEX Directive
CENELEC EN 50021:1999 Hazardous Area Classification
CENELEC EN 50014:1997
CENELEC EN 50020:1994
CENELEC EN 61010-1
CENELEC EN 61326 Class A emissions, Annex A immunity
CENELEC EN 50024
CENELEC EN 55022 Class A or B emissions



Industry Guidelines used by the DeltaV System

- IEC Publication 255-4 Single Input Energizing
- IEC Publication 546:1976 Controller Performance Evaluation
- IEC Publication 770:1984 High Frequency Disturbances
- IEC 38, Amendment 1 [1994]
- IEEE 518 Installation Guide to Minimize Noise

Background on NAMUR

History

NAMUR was founded at Leverkusen, Germany, on 3 November 1949 as the body to represent the interests of the users of measurement and control technology in the chemical industry by such renowned experts in the field as Dr. Sturm (Bayer), Dr. Hengstenberg (BASF) and Dr. Winkler (Hüls) following the tried and tested traditions of IG-Farbenindustrie (AGEMUR).

At the second meeting in December 1949, the founding members of the working group settled the name: Standardization association for measurement and control in chemical industries—short NAMUR

Former Activities

After the war, main activities of the process measurement department have been measurement; control loop analysis; standardization, especially interfaces (4-20 mA signal, proximity switch); and exchange of experience of devices.

Activities Today

Activities of NAMUR include:

- measuring
- process-analytics
- open- and closed-loop control automatisation
- communication
- operation technology
- process electrics

throughout the whole lifecycle from planning, assembly and operation to decommissioning.

Objectives

Working Results

Working results are focused on the needs of the member companies and are highly practice-oriented.

NAMUR endeavours to achieve economically and technically outstanding working results. In this process, safety and the protection of the environment are indispensable. NAMUR is committed to the idea of "responsible care."

The proposed solutions are formulated on the basis of a holistic approach to process technology processes, taking into consideration the lifecycle costs of devices and systems.

The results of the work of NAMUR are published in a suitable form.

Exchange of Experience

The exchange of experience serves the use of inter-company synergy potentials, the dissemination of knowledge and experience, the communication of user interests, the quick exchange of information on current issues, in-service training, and education.

Requirements

A coordination of requirements takes place in the further technical development of devices and methods with the aim of influencing the manufacturers.

Influencing the manufacturers is necessary because of the feedback of information from application technology practice to the manufacturer, to improve the quality of products and avoid excessive product diversity, to achieve cost advantages for users and manufacturers.

Co-operation

Cooperations exist with other associations to increase efficiency, to avoid duplication of work and to coordinate representation of interests. Examples of cooperation with other organizations are:

Measuring and Control Technology

- [GMA](#)
VDI/VDE Gesellschaft für Meß- und Automatisierungstechnik
- [ZVEI](#)
Zentralverband Elektrotechnik- und Elektroindustrie
- [WIB](#)
International Instrument User's Association
- [INTERKAMA](#)
Internationale Fachmesse für industrielle Kommunikations-, Automatisierungs-, Mess- und Analysetechnik

Standardization

NAMUR co-operates in the standardisation bodies for the industry.

Participation in Rule Making is effected by a co-ordinated, appropriate influence being exerted on standardization bodies supervisory bodies and authorities to actively design chemical industry standards, to prevent cost-increasing standards alien to the industry.

- [DIN/DKE](#)
Deutsches Institut für Normung / Deutsche Elektrotechnische Kommission im DIN und VDE
- [CEN/CENELEC](#)
Comité Européen de Normalisation/Comité Européen de Normalisation Electrotechnique
- [ISO/IEC](#)
International Organization for Standardization/International Electrotechnical Commission

Division of Labor

Division of labor takes place, for example, in quality inspection and in standardisation work. Practical examples of the division of labor are to be found in market observation, the examination of hardware and software, and the appointment of people to association bodies.

Members

Out of the current number of 66 member companies in the chemical/pharmaceutical industry in the German speaking region two thirds originate from Germany. The rest come from Spain, Austria, Hungary, Switzerland, Belgium and the Netherlands.

NAMUR is an association of users of process control technology.

Manufacturers of process control technology, hardware and software are not eligible as members.

Germany




- [Acordis Cellulosic Fibres](#) 
- [Agfa-Gevaert AG](#) 
- [Axiva](#) 
- [BASF AG](#) 
- [Bayer AG](#) 
- [Boehringer Ingelheim Pharma KG](#) 
- [Buna Sow Leuna Olefinverbund GmbH](#) 
- [BVCT e.V.](#) 
- [Celanese GmbH](#) 
- [Centeon Pharma GmbH](#) 
- [Chiron Behring GmbH](#) 
- [Clariant GmbH](#) 
- [Condea Chemie GmbH](#) 
- [DEA Mineraloel AG](#) 

- [Dechema e.V.](#) The Dechema logo is a blue square with a white circular emblem in the center. The emblem contains a stylized chemical apparatus and the word "DECHEMA" in white capital letters.
- [Degussa-Hüls AG](#) The logo for Degussa-Hüls, featuring the company name in a brown, serif font.
- [Deutsche BP AG](#) The BP Amoco logo, with "BP" in a bold, italicized font and "Amoco" in a regular font, both in black.
- [Deutsche Shell Raffineriezentrum Köln](#) The Shell logo, which is a red and yellow scallop shell on a dark blue rectangular background.
- [DyStar Textilfarben GmbH & Co.](#) The DyStar logo, featuring the word "DyStar" in black on a yellow rectangular background, with a small gear icon to the right.

- [EC Erdölchemie GmbH](#) 
- [Elenac GmbH](#) 
- [Esso AG](#) 
- [H.C. Starck GmbH & Co. KG](#) 
- [Henkel KGaA](#) 
- [Hoechst Marion Roussel Deutschland GmbH](#) 
- [Hoffmann - La Roche AG](#) 
- [Hüls Infracor GmbH](#) 
- [InfraServ GmbH & Co. Höchst KG](#) 
- [InfraServ GmbH & Co. Knapsack KG](#) 
- [ISP Marl GmbH](#)
- [KoSa GmbH & Co. KG](#) 
- [Kronos International](#) 
- [Krupp-Uhde GmbH](#) 
- [Lurgi Öl-Gas-Chemie GmbH](#) 
- [MERCK KGaA](#) 
- [OMV Deutschland GmbH](#) 
- [Phenolchemie GmbH](#) 
- [Polymer Latex GmbH & Co. KG](#) 
- [Röhm GmbH Chemische Fabrik](#) 
- [Rütgers VFT AG](#) 
- [Schering AG](#) 
- [SKW Trostberg AG](#) 
- [Solvay Soda Deutschland GmbH](#) 

- [Stockhausen GmbH](#) STOCKHAUSEN
- [Trevira GmbH](#) Trevira
- [Th. Goldschmidt AG](#) TH. GOLDSCHMIDT AG
- [VEBA - Oel AG](#) VEBA OEL
- [Wacker Chemie GmbH](#) WACKER
- [Wintershall AG](#) wintershall

Austria

- [Agrolinz Melamin GmbH](#)
- [Akronym OMV](#)
- [Biochemie GmbH](#) Biochemie
- [Chemserv Industrie Service GmbH](#) chemserv
- [DSM Fine Chemicals GesmbH](#)
- [Lenzing AG](#) LENZING


Switzerland

- [Clariant International AG](#) Clariant
- [Hoffmann - La Roche AG](#) Roche
- [Lonza AG](#) algroup lonza
- [Novartis Services AG](#) NOVARTIS

Netherlands

- [Akzo Nobel Engineering bv](#) AKZO NOBEL
- [DSM Service](#) DSM
- [Thermphos International B.V.](#)

Belgium

- [BASF Antwerpen N.V.](#) BASF
- -



- [Bayer Antwerpen N.V.](#) **Bayer**

Hungary

- Magyos - Hungarian Pharmaceutical

Spain

- [BASF Espanola S.A.](#) 

Publications

The results of the work done by NAMUR are published:

- as publications in [atp](#) (Automatisierungstechnische Praxis) or other trade magazines (like [at](#), [tm](#), [etz](#), [CIT](#), [process](#), [chemie Technik](#), [Chemie Produktion](#))
- in NAMUR Status Reports (85, 87, 90, 93, 97)
- in NAMUR Recommendations and Worksheets
- in presentations at the Annual General Meeting (not public)
- in speeches made at workshops and congresses of cooperating associations ([GMA](#), [GVC](#), [Dechema](#), [WIB](#))

NAMUR Recommendations and Worksheets

NAMUR Recommendations and Worksheets are experience reports and working documents prepared by NAMUR for its members among process control users for facultative utilisation.

These papers should not be viewed as standards or guidelines.

Individual copies of NAMUR recommendations may be obtained from the Registered Office free of charge.

The complete edition of NAMUR recommendations and worksheets is available on CD-ROM. There is an update once or twice a year, depending on the number of new documents.

The following English NAMUR Recommendations and Worksheets are currently available:

NE 21 engl.	Electromagnetic compatibility(EMC) of industrial process and laboratory control equipment. 18.05.99
NE 31 engl.	Safety of Process Plants Using Measurement and Control Equipment 11.02.95
NE 33 engl.	Requirements to be met by Systems for Recipe-based Operations 19.05.92
NE 43 engl.	Standardization of the Signal Level for the Breakdown Information of Digital Transmitters 27.06.96
NA 46 engl.	Application Example of Batch Control NE 33 14.05.96
NE 58 engl.	Execution of Process Control Projects Subject to Validation 01.03.97
NE 59 engl.	Functions of the Operation Management Level in Batch Oriented Production 01.02.96
NE 68 engl.	Validation of Process Control Systems - Retrospective Validation of Legacy Systems 15.05.97
NE 72 engl.	Validation of Process Control Systems 03.02.99
NA 76 engl.	NAMUR-Checklist for Control Rooms 27.08.99
NA 84 engl.	Year 2000—Procedures for Process Control Instruments and Systems