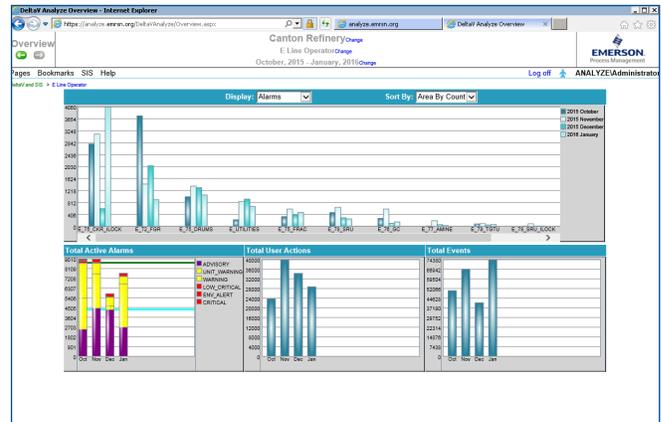


DeltaV™ Analyze

- Continuous automated DeltaV System alarm system performance monitoring
- Trends of alarms, events, and user actions
- Identification of control modules and devices causing nuisance alarms
- Configuration-free web page viewing
- Alarm System Key Performance Indicator Reports per EEMUA-191, ISA-18.2, and IEC62682



The DeltaV Analyze Overview page summarizes your plant alarm and event performance.

Introduction

Are you concerned about alarm performance and its impact on your operator effectiveness? Often, fewer than 10 modules will cause 75% or more of the system's alarm activations. So by addressing just a few alarms you can significantly reduce operator alarm loading.

DeltaV Analyze makes it easy to find the alarms that occur most frequently, stale alarms, fleeting alarms, chattering alarms, alarms that experience long delays for operators to acknowledge and those that are most often suppressed.

DeltaV Analyze is built-for-purpose, easy to install, and ready out-of-the box to gather, organize, and present information in point-and-click graphical webpages. Zoom from the big picture to details of interest, or schedule periodic Key Performance Indicator (KPI) reports, all with no user query writing, report design, or other burdensome configuration.

Benefits

Display up-to-date alarm performance. DeltaV Analyze continuously processes your Event Chronicle or Plantwide Event Historian so that you have up-to-date performance information, whenever you need it.

Display monthly trends of alarms, events, and user actions. Compare any 12-month period to spot overall trends by process area, for the whole system or a specified operator workstation. At a glance, you can view any problems and see whether your plant is adhering to your alarm performance goals.

Pinpoint control modules and devices causing excessive and nuisance alarming. DeltaV Analyze identifies the modules and devices with the most frequently occurring alarms, and presents them in order of frequency. Thus, you can simply start at the top and work your way down the list of "noisy" tags.

Configuration-free structured web page viewing throughout your enterprise. Everything you need is laid out on DeltaV Analyze web pages. Simply select the page you want — Summary, Alarm Statistics, etc. — and the appropriate data is analyzed and presented. Drill in to evaluate a specific alarm priority or event type; further narrow your view to specific areas or units; or change the time span. With each choice, the whole page adjusts based on your selection.

Alarm Statistics Report

Group Name	Included Areas	Reporting Period	
E Line Operator	E_72_FGR, E_75_CKR_ILLOCK,	Start	1/2/2016 12:00 AM
Scope	E_75_DRUMS, E_75_FRAC,	End	1/31/2016 11:59 PM
DeltaV and SIS	E_76_GC, E_77_AMINE, E_78_SRU,	Duration(Hrs)	720
Datasource	E_78_SRU_ILLOCK, E_79_TGTU,	Alarm Priorities	
Canton Refinery	E_80_SWS, E_ILLOCK_MON, E_SIS_	6-15	
Alarm Category	ILOCKS, E_UTILITIES		
Process			

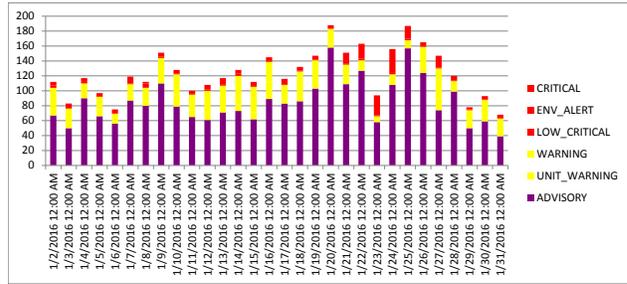
Key Performance Indicators

Reporting Period Metrics	Result	Comment
Total Number Of New Alarms	3709	
Total Number of Alarm Floods	14	Start >=10 in 10min. End <5 in 10min.
Total Number of Alarm Suppression Actions	424	
Total Number of Stale Alarms	16	
Standing Alarms at Period End	5	Not including alarms > 720+ hours old

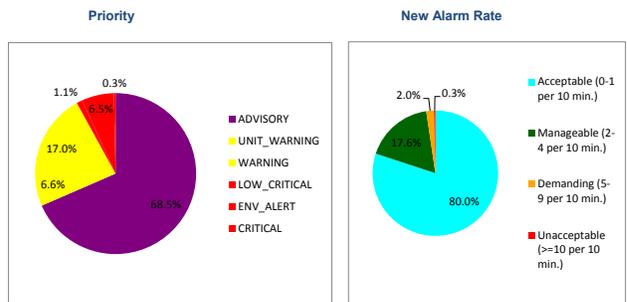
Primary KPIs	Result	Comment
Average Alarm Rate (Per Day)	123.63	Acceptable
Average Alarm Rate (Per Hour)	5.15	Acceptable
Average Alarm Rate (Per 10 Minutes)	0.86	Acceptable
Percent of Hours Containing More Than 30 New Alarms	0.28%	
Peak Number of Alarms in a 10 Min. Period	28	Unacceptable
Percent of Time in Alarm Flood Condition	0.44%	
Top 10 Alarm Source Contribution	31.25%	
Chattering and Fleeting Alarm Sources	61	
Alarm Priority Distribution	See pie chart	Counts are shown in Alarm Priority tab
Avg. Number of Alarms During Floods (Per Hr)	73.26	Unacceptable
Avg. Number of Alarms Excluding Floods (Per Hr)	4.85	Acceptable
Percent of 10 Min. Periods with > 10 New Alarms	0.28%	

Other Indicators	Result	Comment
Peak Alarm Date and Time	1/20/2016 6:10 AM	
Average Time to Acknowledge	00:00:34	Days:Hours:Minutes:Seconds
Peak Time to Acknowledge	04:41:47	E_75_CKR_ILLOCK E_75_SIS_ILKS I1_D7502_1F
Average Time Alarm Active	00:50:58	Days:Hours:Minutes:Seconds
Peak Time Alarm Active	13.15:13:33	E_75_CKR_ILLOCK E_75_SIS_ILKS I1_D7501_1F
Average Time Alarm Suppressed	3.10:25:28	Days:Hours:Minutes:Seconds
Peak Time Alarm Suppressed	14.23:54:08	LIC751735
Avg. Number of Operator Changes (Per Day)	624.93	Excludes alarm acknowledgements

Alarm Timeline



Alarm Distribution



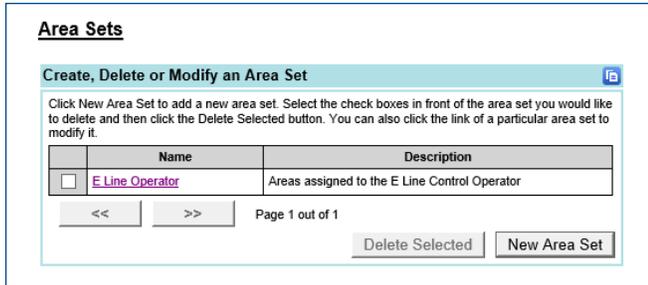
The Alarm Statistics Report provides Key Performance Indicators per EEMUA-191, ISA-18.2, and IEC62682 definitions, in an easy to share Microsoft Excel format. Additional pages (not shown) identify actionable lists of nuisance alarm sources.

Alarm System KPI reports. The EEMUA-191, ISA-18.2, and IEC62682 publications all stress the importance of periodic measurement of KPIs. DeltaV Analyze provides a ready-to-use KPI report that can be scheduled or run on-demand and optionally filtered by operator console position, alarm priority range, and alarm classification. The report contains twelve primary KPI calculations, eight secondary alarm performance indicators, pie charts for alarm priority and rate distribution, and timeline alarm activity charts for the report period and day with the most alarms. Also, the report contains top-twenty lists of frequent, fleeting, stale, most slowly acknowledged, and most often-suppressed alarms, and a list of disabled alarms, and a summary of individual alarm floods. Information sharing is simplified with the report's Microsoft Excel format and user control over file naming and destination folder. Reports can be produced on demand or scheduled by shift, day, week, or month.

Compare your plant's incoming alarm rates to the EEMUA-191 benchmark, or to your own benchmarks. The primary measure of alarm system performance is the incoming rate of alarms that require operator acknowledgement, measured per operator position.

Alarm Rate	Per 10 Minutes
Acceptable	0 – 1 alarms
Manageable	2 – 4 alarms
Demanding	5 – 9 alarms
Unacceptable	>= 10 alarms

DeltaV Analyze allows you to edit or create new alarm rates and thresholds according to your local alarm philosophy, or use the default EEMUA-191 alarm rates.



Organize Views and Reports by Operator Position.

Identify the DeltaV Process and SIS Areas assigned to each operator console position, then let DeltaV Analyze do the rest; presenting views and reports according to console position, applying your alarm rate benchmarks and KPI computations per EEMUA-191, ISA-18.2, and IEC62682.

Alarm system performance metrics contained in the DeltaV Alarm Statistic Report

- Annunciated alarms per day
- Annunciated alarms per hour
- Annunciated alarms per 10 minutes
- Percentage of hours containing more than 30 alarms
- Percent of 10 minute periods with more than 10 alarms
- Peak number of alarms in a 10 minute period
- Percent of time in alarm flood condition
- Percent contribution of top 10 most frequent alarm sources
- Count of chattering and fleeting alarm sources
- Count of alarms active more than 24 hours
- Annunciated alarm priority distribution
- Alarm rate distribution
- Annunciated alarms per hour during alarm floods
- Annunciated alarms per hour excluding alarm floods
- Standing alarms at close of report period
- Average time to acknowledge alarms
- Peak time to acknowledge an alarm

- Average time an alarm is active
- Peak alarm active time
- Average time an alarm is suppressed
- Peak alarm suppression time
- Average number of operator changes per hour

Product Description

DeltaV Analyze provides a comprehensive view of the DeltaV alarms, events, and user actions recorded in the Event Chronicle (active data set) of the system where it is installed or from multiple DeltaV system events that have been consolidated into a Plant Event Historian.

The Overview page is displayed when DeltaV Analyze is first accessed (see illustration on cover page). By default, the Overview page shows the monthly alarm, event, and user actions accumulated for the past 12 months.

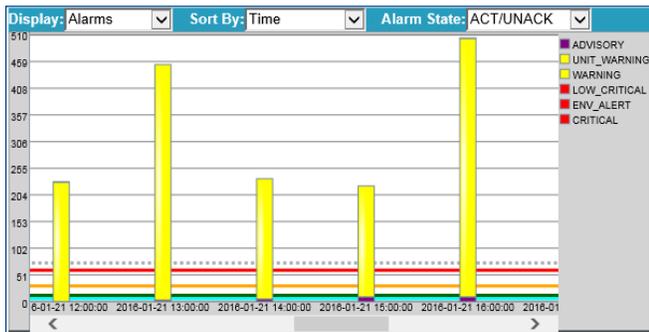
Alarm rate thresholds (either the default EEMUA-191 benchmarks or your own) are displayed on the Overview screen and other relevant pages. A casual look at the Overview page may be all that is needed to know that alarm system performance meets your plant criteria.

If you want more detail, select the month and operator console (or individual area) of interest. Several pages are provided to highlight various specific alarm and event issues. So it is simple to find the tags causing the most problems. A common approach in plants is to target the top 10 high-frequency tags for alarm review each month.

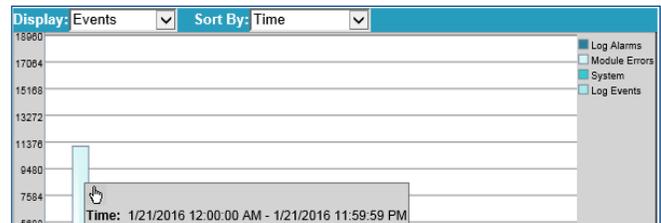
In-Depth Analysis pages (some of which are discussed in more detail below) provide point-and-click filtering and drill-down capabilities to closely examine event records for time ranges of up to 31 days. These include pages for Alarm Statistics, Alarms, Events, Log Alarms, Log Events, Module Errors, Summary, System, and User Actions.

The Summary page provides module or device activity for alarms, events, and user actions (see illustration on following page). The modules or devices with the most alarms, events, and user actions are displayed in scrollable tables. Data in these and other tables can be selected and copied into other applications such as Microsoft Excel.

The Summary page shows modules with the most alarm annunciations, events, and user actions.



Click to zoom to a per-hour, 10-minute, or one-minute view.



Drill into events or user actions.

It is easy to bookmark a favorite page and filter combination so that you can quickly return to the same date and information, or to always look at a relative time for specific data. For example, a bookmark might show alarm information for the last week for each shift.

Switch between views of alarms, events, and user actions to identify factors contributing to alarms and operator changes. Web pages are provided (not illustrated) to drill into event and user action details.

Alarm Statistics					
Pages Bookmarks SIS Help					
DeltaV and SIS > E Line Operator					
Summary					
Area	Suppressed Alarms	Disabled Alarms	Average Acknowledgement Time	Average Activation Time	Total Activation Time
E_75_CKR_ILOCK	14	246	00:01:44	00:37:26	105:06:01:21
E_72_FOR	87	0	00:00:24	00:52:25	35:03:14:13
E_UTILITIES	75	9	00:00:26	00:54:57	27:15:15:43
E_75_DRUMS	243	69	00:00:21	00:25:37	20:07:17:14
E_75_FRAC	36	0	00:00:43	00:04:21	1:12:24:50
E_77_AMINE	13	0	00:00:41	00:47:11	1:09:01:54
E_76_GC	16	0	00:00:25	00:08:58	1:00:05:37
E_78_SRU	33	0	00:00:26	00:03:10	13:36:12
E_79_TGTU	0	0	00:00:12	00:02:35	02:33:08
E_78_SRU_ILOCK	0	0	00:00:29	00:12:29	01:14:59
E_80_SWS	0	0	00:00:15	00:02:58	00:05:57

The Alarm Statistic page gives instant access to alarm system KPIs.

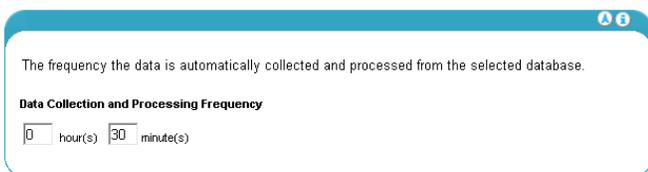
You can view and drill into alarm statistics to determine which alarms were active for long (or short) periods of time, as well as alarms that have been repeatedly suppressed or disabled. A copy to clipboard control is provided for all data grids for easy transfer to spreadsheets.

Security

DeltaV Analyze user access is based on Windows security. Simply select the Windows users who have permission to view DeltaV Analyze web pages. They log in with the same Windows user name and password.

Automatic Processing

DeltaV Analyze automatically processes events from the DeltaV Event Chronicle active data set or Plantwide Event Historian (PEH) on a scheduled basis.



Schedule the frequency of event record processing.

Off-System Processing

With the off-system processing option, event processing (the creation of intermediary XML data files) can be performed on-demand on Event Chronicle files, including files from other DeltaV systems. The processed XML files can be shared with other sites that have DeltaV Analyze, even if they don't have the off-system processing option.

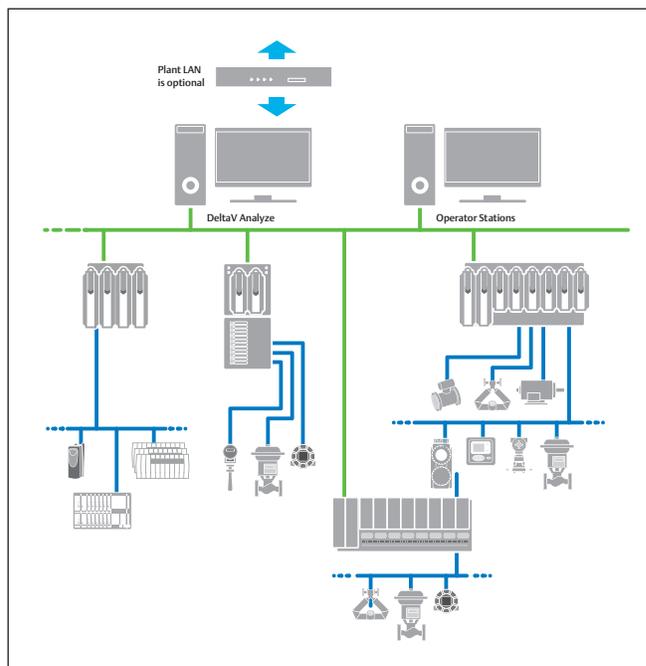
Processing an entire Event Chronicle may be resource-intensive, and a dedicated computer should be considered when selecting this option.

Off-system processing is not available when DeltaV Analyze is used with PEH on a non-DeltaV computer. Processing of Event Chronicle text archives is not supported.

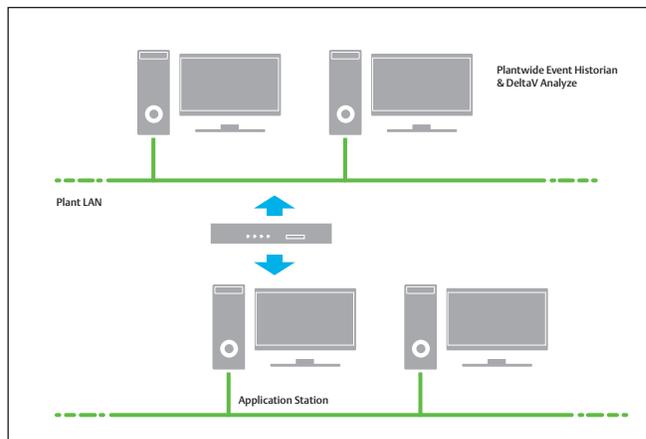
Installation

DeltaV Analyze may be installed on the same or a different workstation than the workstation that has the event database to be analyzed.

Microsoft Excel must also be installed on the workstation to support creation of Alarm Statistics reports.



DeltaV Analyze installed on the same DeltaV workstation as the Event Chronicle.



DeltaV Analyze installed on Plant LAN.

Microsoft's Internet Information Services (IIS) must be enabled on the workstation, making it the DeltaV Analyze web page server. The release notes provide detailed instructions for IIS setup. Note that Microsoft IIS does not support workstation names containing an underscore (_) where a DeltaV workstation otherwise allows it.

DeltaV Analyze can be set up as a standalone system (webpages can only be viewed from that workstation) but IIS is still required. The release notes provide details for this type of installation.

The DeltaV Analyze Administrator allows customization of: event file processing frequency, alarm priority colors, plant shifts, alarm rate bands, areas associated with operator console positions, and scheduled reports.

Certain Internet Explorer security settings are required on client computers to allow the DeltaV Analyze webpages to work properly and are documented in the release notes.

Refer to Knowledgebase Article AK-1600-0009 Addendum to DeltaV Analyze v4.0 Release Notes for additional information.

Multiple DeltaV System Applications

Several approaches can be taken to accommodate multiple DeltaV systems, with various tradeoffs.

Strategy	Considerations
One DeltaV Analyze System per DeltaV system.	Fully automatic event processing for local system alarm analysis. To compare multi-system performance, corporate analysts would need to receive the Excel Alarm Statistics reports or XML files from each system (typically monthly), or alternately if WAN system connectivity permits, switch between webpages hosted by each system.
Just one of the multiple DeltaV systems has DeltaV Analyze (could be a Simulate System) with the off-system processing option.	Manual recurring effort (typically monthly) to harvest and process event chronicle files from the non-Analyze systems. A lower-cost solution.
Each DeltaV system has an OPC A&E Server and PEH single-client connection, to transfer information to a central PEH with a single DeltaV Analyze system for PEH.	Fully automated event processing for local and corporate system alarm analysts. Needs multiple OPC connections to transport raw alarm and event information to a central PEH database. Potential sorting/reporting conflicts if systems have like-named areas.

Disk Space Usage

Disk space usage varies based on the amount and type of events processed. Typical disk space usage is estimated at 1Mbyte/day/system. Disk space used can be up to 20 Mbyte/day for facilities with hundreds of thousands of events/day.

Disk Space Usage	Typical	Maximum
Application	680 Mbyte	700 Mbyte
Processed files	1Mbyte/day	20Mbyte/day*

* DeltaV Analyze can process event records up to a maximum rate of 1 million records per day.

System Compatibility

DeltaV Analyze v4.0 is compatible with DeltaV 12.3.1 English, DeltaV v13.3 English, and with DeltaV v13.3.1 English, Japanese, French, and Russian. Consult the factory for availability of older DeltaV Analyze versions that may work with older DeltaV system versions.

DeltaV Analyze v4.0 is compatible with non-DeltaV workstations with a Windows Server 2008 operating system. See KBA AK-1600-0009 for additional details.

DeltaV Analyze v4.0 supports Internet Explorer IE9 and IE11.

DeltaV Analyze v4.0 supports 32-bit versions of Microsoft Office 2010SP1, 2013SP1, and 2016.

Recommended client memory is 500 Mbytes. Concurrent user timeout is 20 minutes. For best results, the resolution of the client display should be 1280 x 1024 or greater.

Standard DeltaV workstation hardware specifications are suitable for DeltaV Analyze.

DeltaV Analyze may be used on DeltaV systems configured as either domains or workgroups.

Remote access of DeltaV Analyze web pages on other workstations require a domain name service (DNS) server. DeltaV domains have a DNS server defined. DeltaV workgroups may need to have a DNS server defined for remote access.

When DeltaV Analyze is applied to the PEH, both are installed on the same computer, which may be either a DeltaV Application Station or a non-DeltaV computer.

DeltaV Analyze may be installed on DeltaV Simulate and System Integrator DeltaV systems.

DeltaV Analyze v4.0 can present webpages and produce alarm statistic reports using intermediate (XML) files previously created with prior versions of DeltaV Analyze.

Ordering Information

DeltaV Analyze for DeltaV Workstations (Connects to the workstation's Event Chronicle data source)	Model Number
DeltaV Analyze (Includes license and v4.0 media).	VE2133
DeltaV Analyze for non-DeltaV Workstations (Connects to a PEH data source)	
DeltaV Analyze (Includes license and v4.0 media).	VF1008
Option for Off-System Data Processing	
Off-system processing for DeltaV Analyze installed on a DeltaV system.	VE21UPG008
Off-system processing for DeltaV Analyze Simulate Standalone (Note that DeltaV Simulate Standalone has a built-in DeltaV Analyze license.)	VE21UPG008
Off-system processing for Multi-Node Simulate Systems (Note that DeltaV Simulate Multi-Node has a built-in DeltaV Analyze license.)	VX21UPG008
Off-system processing is not available for DeltaV Analyze for non-DeltaV workstations.	
Software Media Alone	
DeltaV Analyze v4.0 media with no license. (Needed for Simulate systems where the DeltaV Analyze license is pre-enabled but no DeltaV Analyze software is provided.)	VEANALYZEDEM

Licensing Notes:

- Licenses originally purchased for DeltaV Analyze v1.3, v2.0 or v3.0 work with v4.0 and do not need to be replaced.
- DeltaV Analyze v4.0 will be provided to Foundation and Guardian Support subscribers for DeltaV systems that are licensed for previous versions of DeltaV Analyze.
- Licenses issued after 2012 permit DeltaV Analyze installations on any type DeltaV workstation.

Related Products

- **DeltaV Event Chronicle.** Captures process, system, and user alarms and events and stores them in a Microsoft SQL Server database.
- **Plantwide Event Historian.** Captures process, system, and user alarms and events and stores them in a Microsoft SQL Server database.

- **OPC Events Server.** Exposes all DeltaV alarm and event information using the industry standard OPC Alarms and Events interface.
- **Alarm Help.** Provides Operators with in-context access to approved alarm response procedures and Control Engineers with native system configuration capability to administer alarm rationalization data per ISA-18.2 - Management of Alarm Systems for the Process Industries.

Footnotes

EEMUA Publication 191 – Alarm Systems: A Guide to Design, Management and Procurement – Third edition, published by the Engineering Equipment and Materials Users Association in 2013. ISBN 978-0-85931-192-2.

ANSI/ISA-18.2-2016 Management of Alarm Systems for the Process Industries – approved March 17, 2016. ISBN: 978-1-941546-86-4

IEC62682 Management of alarms systems for the process industries, published by the International Electrotechnical Commission in 2014, ISBN 978-2-8322-1868-6.

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