Fieldbus Foundation – India Marketing Committee

Fieldbus Foundation
End Users Council Conference-2009

Date : 19th June, 2009 ( Friday )
Time : from 09:00 am to 06:00 pm.
Venue : The Maratha, Sahar Road, Andheri (East) Mumbai

Improved Operator Efficiency by support of Namur 107 in Foundation Fieldbus
Presentation Contents

• Why focus on the Operator Efficiency?
• Trends affecting the Operator Efficiency?
• How can Namur 107 improve the Operator Efficiency?
Operator Effectiveness is essential

- Secure the production process and the quality of produced products
- Take proper actions in case of process changes or process events, e.g. a failing instrument or a leaking pipe

The global process industry loses $20 billion, or five percent of annual production, due to unscheduled downtime and poor quality.

ARC estimates that almost 80 percent of these losses are preventable and 40 percent are primarily the result of operator error.
Why focus on the operator?

- Operators are an integrated part of automated control loops
- Operators makes decisions in critical situations
- 40 % of production losses can result because of operator errors
- Responsibility and process complexity are growing
Issues today in many control rooms

- There is no good overview of the process
- All applications are not integrated
- Many different types of terminals and interfaces with unsynchronized data
- Information like device diagnostics can be inconsistent
What is needed to achieve Operator Effectiveness?

1. A good overview of the process and its status
   - Clear and harmonized information independent of source of data

2. All relevant information available in one easy-to-use environment
   - Only relevant information for each operator or maintenance person
Presentation Contents

- Why focus on the Operator Efficiency?
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Trends affecting the Operator Efficiency?

1. **Consolidation** of operation
2. **Integration** of functionality
3. **Technology** trends
Consolidation of Operation

- Several separate systems and applications will be controlled from a common control room to:
  - Improve operation performance and productivity
  - Reduce cost of Operation and Maintenance

The Operator Environment has to manage more information from several systems and applications.
Trends affecting the Operator Efficiency?

1. Consolidation of operation
2. Integration of functionality
3. Technology trends
Integration of functionality

The Operator Environment has also to manage information from several applications.

Trends affecting the Operator Efficiency?

1. Consolidation of operation
2. Integration of functionality
3. Technology trends
Technology trends
Technology trends

• Technology driven development
• Not always in favour for operator efficiency
Technology trends

Today a modern Operator Environment:

- is capable to manage information from several applications and systems

- is adapting standards like NAMUR NE107 for improvements of the Human Machine Interface
Presentation Contents

• Why focus on the Operator Efficiency?
• Trends affecting the Operator Efficiency?
• How can Namur 107 improve the Operator Efficiency?
Namur Organization

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Namur Organization

- **NAMUR** is an international user association of automation technology in process industries.
- NAMUR is engaged in the following key activities:
  - pooling experiences among its member companies
  - compiling aids and check lists for member companies
  - setting user requirements on new devices, systems and technologies
  - participating in national and international standardization bodies
- NAMUR represents approx. 15,000 PCS experts, of whom approx. 300 are active in 33 working groups in the fields of:
  - measurement & control, automation, communication, process control and electrical engineering over
NAMUR and Foundation Fieldbus

• Cooperation started May, 2006

End Users To Benefit From Fieldbus Foundation And NAMUR Working Group 2.6 Fieldbus Collaboration

AUSTIN, Texas, May 3, 2006 — The Fieldbus Foundation, conducting a press briefing on April 25, 2006 at the INTERKAMA Trade Fair in Hannover, Germany, announced the establishment of a liaison relationship between the Fieldbus Foundation and Working Group 2.6 Fieldbus of NAMUR, the international process industries’ end user group based in Germany. This cooperation will focus on two key issues: grounding and shielding and device diagnostics profiles. These topics have been identified by both parties as areas that require further clarification and guidance – particularly benefiting end users within the process industries across the EMEA region.
NAMUR Recommendation NE 107

The aim of Namur NE107 recommendation:

• To summarize how to make use of diagnosis from field devices to support operators to take appropriate actions as required

Remarks:

• The responsibility lies always with the user to draw conclusions based on the diagnosis

• The diagnosis must thereby always be viewed in the context of the application
NAMUR Recommendation NE 107

NE107: “Self-Monitoring and Diagnosis of Field Devices”

- Diagnosis results must be reliable
- Internal diagnosis categorized into 5 standard status signals
- Configuration should be flexible depending on the user's requirements
- The plant operator should only see these status signals
- The diagnosis results must always be viewed in the context of the application
- Detailed information available for device specialist
NE107: “Self-Monitoring and Diagnosis of Field Devices”

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Diagnosis categorized into 5 standard status signals

<table>
<thead>
<tr>
<th>Status signal</th>
<th>Color</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal; valid output signal</strong></td>
<td>![Green]</td>
<td>![Green]</td>
</tr>
<tr>
<td><strong>Maintenance required; still valid output signal</strong></td>
<td>![Blue]</td>
<td>![Oil]</td>
</tr>
<tr>
<td><strong>Out of specification; signal out of the specified range</strong></td>
<td>![Yellow]</td>
<td>![Warning]</td>
</tr>
<tr>
<td><strong>Function check; temporary non-valid output signal</strong></td>
<td>![Orange]</td>
<td>![Wrench]</td>
</tr>
<tr>
<td><strong>Failure; non-valid output signal</strong></td>
<td>![Red]</td>
<td>![X]</td>
</tr>
</tbody>
</table>
NAMUR Recommendation NE 107

NE107: “Self-Monitoring and Diagnosis of Field Devices”

☑️ Diagnosis results must be reliable
☑️ Internal diagnosis categorized into 5 standard status signals
☑️ Configuration should be flexible depending on the user's requirements
  • The plant operator should only see these status signals
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  • Detailed information available for device specialist
Diagnosis categorized into 5 standard status signals

**Device**
- OK
- Communication OK
- Maintenance required
- Warning: Maintenance required
- Maintenance mode
- Simulation Mode
- Error
- Configuration error
- Communication error
- Process error
- X
- Y
- Z

**Vendor specific status**

**Namur NE107 status**
- Normal
- Maintenance required
- Out of specification
- Function check
- Failure

Device mapping
Mapping of FF Device diagnostics to Namur NE107

<table>
<thead>
<tr>
<th>FF Device with Vendor Specific diagnostics</th>
<th>Device Library part of Automation System</th>
</tr>
</thead>
</table>
|                                           | New FF device parameters e.g.:
|                                           | - Enable/disable
|                                           | - Priority
|                                           | - Map
|                                           | - x

<table>
<thead>
<tr>
<th>New FF Device Alarms</th>
<th>NE107 Status Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail_ALM</td>
<td>Failure</td>
</tr>
<tr>
<td>OffSpec_ALM</td>
<td>Out of Specification</td>
</tr>
<tr>
<td>Maint_ALM</td>
<td>Maintenance Request</td>
</tr>
<tr>
<td>Check_ALM</td>
<td>Function Check</td>
</tr>
</tbody>
</table>

Vendor defined configuration

User defined configuration
NAMUR Recommendation NE 107

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Harmonized status signals

Process Display

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NE107: “Self-Monitoring and Diagnosis of Field Devices”

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Device diagnosis in the context of the application

Power Management

Process Automation

Maintenance application

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Harmonized status signals

Process Display
Harmonized status signals

Safety Overview Display
Harmonized status signals

Maintenance Display

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NAMUR Recommendation NE 107

NE107: “Self-Monitoring and Diagnosis of Field Devices”

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Detailed information available for device specialist

Maintenance Display
Detailed information available for device specialist

Asset Monitor

EDDL Menus and Methods
Improved Operator Efficiency

Asset monitor is triggered by FF maintenance alarm

Operation

Analysis

Maintenance

Reporting

Details via EDDL
Menus and Methods

Monitoring

Decision

Submit

FF Device diagnostics included in CMMS work-orders

Action

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Summary

• The harmonization of device status is a key initiative to support improvement of the operator efficiency in an environment of increasing complexity, information flow and call for continuously improvements

• Namur NE107 is a standard to harmonize the status information from process devices for plant operation and maintenance

$ Operation more efficient and safer
=> harmonized user interface

$ Configuration and Maintenance easier
=> harmonized status from Device suppliers
Thank You

Questions