All about Ex personnel competencies

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INTRODUCING

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- ExNB Certification Institute for assets and personnel competencies
- IndEx Middle East FZE
- IECEx CoPC RTP
Summary - Abstract

- Hazardous Area industries require competent people being active in all levels. Competency has to be shown both on theoretical and practical level. Competency is not just one time exercise, it has to be refreshed in every 5 yrs to comply latest industry regulations and trends. Hazardous Area Competency (HAC) shall be the basis for both electrical and non-electrical explosion protection. HAC is an add on to one's basic knowledge of being electrician or mechanical fitter (further education).
- we can talk about units of competencies, but all are related to one's position on site incl. daily routine duties.
- our presentation will highlight the definition of competencies related to IEC standards 60079-14, -17 and -19, incl. ISO 80079. using the definition how we can build up inhouse competency systems for improvement of overall safety of hazardous area industries.
Structure

• What is competence?
• How do you get it
• Why is it important?
  – Avoid accidents
  – Compliance with requirements (legal, contractual and moral)
• Why you should demand and verify it?
| Type: CB 50C-160 |
| Code: G1 MG12 |
| No.: 18-3471954A |
| Ø 157 |
| MEV 0.4 |
| eff. L - 1% |

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**indukta**

3 ~ MOTOR  Duty: S1  II3G Ex nA IIC T3Gc

Type: 2SiELn 132S-B2  -

Ins.cL.F  IP: 55  Fix-A  IM: B3/B5

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<th>kW</th>
<th>rpm</th>
<th>A</th>
<th>n%</th>
<th>Cos</th>
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What is COMPETENCY?

• Competence = Application of knowledge and skills to the standards of performance required in the workplace.

• Competency includes all aspects of work performance and not just specific skills...
  – Persons must be aware of the hazards in their work area and work safely in their presence
  – Persons must know what they are doing under various scenarios
  – Equipment must be used correctly
Elements of Competency

Competency involves three elements:

1. Qualifications (Off the Job)
2. Experience (On the Job)
3. Recent and Relevant Training (Off and On the Job)

that enable safe working on or near Ex equipment
ISO / IEC 17024 Principles

ISO/IEC 17024 - International Standard for Bodies Operating Certification of Persons is based on:

1. Impartiality  
   (Clauses 4.3 and 3.15)

2. Confidentiality  
   (Clauses 6.1.6 and 7.3)

3. Security  
   (Clause 7.4)

4. “Separation” ....  
   – ... of training and assessment activities  
     (Clause 5.2.3)
   – ... of decisions on certification  
     (Clauses 4.2, 6.3, 9.4.2 and 9.4.4)

5. Management System requirements  
   (Section 9)
One Example

• Ex installation
• All done
• But: ...
Explosion protection – law of Ex safety mitigations

- **First** – avoid the presence of hazardous material
- **Second** – do not ignite if any hazardous material present / eliminate all possible sources of ignition
- **Third** – if you can avoid or limit the presence of hazardous material: safety distance, bursting disc, etc.
Ex personnel competency is about understanding, and its application on site

- Ex personal competency is not only about installation, operation and maintenance
- It is about understanding of all possible **ignition sources**:
  - Flames;
  - Direct fired space and process heating;
  - Use of cigarettes/matches etc;
  - Cutting and welding flames;
  - Hot surfaces;
  - Heated process vessels such as dryers and furnaces;
  - Hot process vessels;
  - Space heating equipment;
  - Mechanical machinery;
  - Electrical equipment and lights
  - Spontaneous heating;
  - Friction heating or sparks;
  - Impact sparks;
  - Sparks from electrical equipment;
  - Stray currents from electrical equipment
  - Electrostatic discharge sparks:
  - Lightning strikes.
  - Electromagnetic radiation of different wave lengths and mobiles
  - Vehicles, unless specially designed or modified are likely to contain a range of potential ignition sources
The management of Ex protection

Sources of ignitions should be effectively controlled in all hazardous areas by a combination of design measures, and systems of work.
Way out

• WE DO HAVE STANDARDS
• WE DO HAVE VARIOUS PERSONNEL COMPETENCY SYSTEMS
  • FOR PERSONNEL
  • FOR COMPANY
## Ex personnel competencies

<table>
<thead>
<tr>
<th>IEC standard</th>
<th>Ex personnel competencies</th>
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<tbody>
<tr>
<td><strong>scope</strong></td>
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<tr>
<td>IEC 60079-14</td>
<td>Electrical installations design, selection and erection – section of realisation</td>
</tr>
<tr>
<td>IEC 60079-17</td>
<td>Electrical installations inspection and maintenance – section of operation</td>
</tr>
<tr>
<td>IEC 60079-19</td>
<td>Equipment repair, overhaul and reclamation – section of repair</td>
</tr>
<tr>
<td><strong>positions</strong></td>
<td></td>
</tr>
<tr>
<td>Responsible persons</td>
<td>Operatives / technicians</td>
</tr>
<tr>
<td>Designers</td>
<td>Technical persons with executive function</td>
</tr>
<tr>
<td>Operative Technician</td>
<td>Responsible persons</td>
</tr>
<tr>
<td>Operatives</td>
<td></td>
</tr>
<tr>
<td><strong>description</strong></td>
<td></td>
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<tr>
<td>who are responsible for the processes involved in the design, selection and erection of explosion protected equipment</td>
<td>who are responsible for the design and selection</td>
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<tr>
<td><strong>validity / refreshment</strong></td>
<td>5 yrs</td>
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Conformity assessment - General requirements for bodies operating certification of persons (ISO/IEC 17024:2012)

One more competency: What about the one who turns on and off one device without touching the Ex integrity?
2 more Ex questions

• EXCHANGE OF A FLUORESCENT TUBE IN AN EX LIGHT FITTING?
  • MAINTENANCE OR REPAIR?

• EXCHANGE OF A BROKEN TUBE IN AN EX LIGHT FITTING?
  • MAINTENANCE OR REPAIR?

• IF REPAIR – PLEASE CONSIDER IEC 60079-19
  • NEED OF AUDITED (ATEX) / CERTIFIED (IEC) REPAIR STATION
  • PROPER TOOLS
  • COMPETENT PERSONNEL
Summary 1

- ONE EX PERSONNEL COMPETENCY SYSTEM IN EACH COMPANY SHALL EXIST
- TRAINING / CERTIFICATION CENTER SHALL BE ACCORDING TO CONFORMITY ASSESSMENT - GENERAL REQUIREMENTS FOR BODIES OPERATING CERTIFICATION OF PERSONS (ISO/IEC 17024:2012)
- PERSONNEL COMPETENCY TO RELEVANT INTERNATIONAL EN/IEC/ISO STANDARDS SHALL BE PROVEN (IF NOT OTHERWISE SPECIFIED)
  - DETAILED KNOWLEDGE OF RELEVANT STANDARDS IS A MUST HAVE
  - WORKING EXPERIENCE, AND RELEVANT EDUCATION (TECHNICAL, HSE, CHEMICAL, PROCESS...) SHALL BE PROVEN BY APPLICANT
- HOW WE MEASURE PERSONAL COMPETENCY?
  - INTERNAL (OWN COLLEAGUES)
  - EXTERNAL (CONTRACTORS)
- DO WE COVER ALL OPERATIONS?
  - DESIGN, INSTALLATION, OPERATION, MAINTENANCE, REPAIR
Summary 2

• Ex competency training shall be a further education

• In a team as a minimum one Ex supervisor, one Ex technician shall be present

• **Minimum personnel competencies:**
  - **General:** Detailed knowledge of explosion protection (gas / dust)
  - **Operative / technician:** read hazardous area classification and design / installation / maintenance / detailed inspection
  - **Supervisor (manager):** HAC / read design / understanding Ex installation and maintenance concepts / close inspection

**Further competencies (optional)**

- **Non-electrical explosion protection:** ISO 80079-36/-37
- **Repair:** IEC 60079-19
- **Design:** IEC 60079-14 with regards to design
### IECEx Units of Competence – for certification ... and for training

<table>
<thead>
<tr>
<th>Reference</th>
<th>Title</th>
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<tbody>
<tr>
<td>Unit Ex 000</td>
<td>Basic knowledge &amp; awareness to enter hazardous area site</td>
</tr>
<tr>
<td>Unit Ex 001</td>
<td>Apply basic principles in explosive atmospheres</td>
</tr>
<tr>
<td>Unit Ex 002</td>
<td>Perform classification of hazardous areas</td>
</tr>
<tr>
<td>Unit Ex 003</td>
<td>Install explosion protected equipment &amp; wiring systems</td>
</tr>
<tr>
<td>Unit Ex 004</td>
<td>Maintain equipment in hazardous areas</td>
</tr>
<tr>
<td>Unit Ex 005</td>
<td>Overhaul &amp; repair of explosion protected equipment</td>
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<tr>
<td>Unit Ex 006</td>
<td>Test electrical installations</td>
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<tr>
<td>Unit Ex 007</td>
<td>Perform visual &amp; close inspection of electrical installations</td>
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<tr>
<td>Unit Ex 008</td>
<td>Perform detailed inspection of electrical installations</td>
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<tr>
<td>Unit Ex 009</td>
<td>Design electrical installations</td>
</tr>
<tr>
<td>Unit Ex 0010</td>
<td>Perform audit inspection of electrical installations</td>
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</tbody>
</table>
Thank you

- Arpad Veress
- Managing Director & Certification Manager
- ExNB Certification Institute
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