Certifier experience:
Comparison of IECEx to NEC

Paul T. Kelly
Principal Engineer
UL LLC – Global hazardous locations
Agenda

- Perspective
- IECEx System Overview
- IECEx Equipment Certification
- NEC HazLoc Equipment Certification
- Comparison of IECEx to NEC Systems
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Perspective

- OSHA NRTL
- SCC Certification Body
- IECEx ExCB & ExTL
- ATEX Notified body
- Brazilian INMETRO CO
- USCG Accepted Laboratory
- MSHA Part 6 Independent Laboratory
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IECEEx System

- US formally joins IECEx in 2001
- 1st US ExCB/ExTL approved in 2002
- US elected chair of ExTAG in 2003
- US elected chair of ExMarkCo in 2007
- US elected chair of ExMC in 2008
- 2 of top 10 ExCBs consistently from US
IECEEx System

- **Equipment Scheme**
  - 56 ExCBs, with 3 USA

- **Service Facilities Scheme**
  - 14 ExCBs, with 1 in USA

- **Personnel Competencies Scheme**
  - 10 ExCBs, with 1 in USA

- **Mark Licensing Scheme**
  - 16 ExCBs, with 1 in USA
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IECEx Equipment Certification

- **Test Reports (ExTRs)**
  - Based on IEC or ISO Ex standards, any edition
  - Self-declaration regarding OrdLoc requirements

- **Quality Assessment Reports (QARs)**
  - ISO 9001 based
  - 18-month cycle for assessments

- **Certificates of Conformity (CoCs)**
  - Supported by active ExTRs and CoCs
  - Within US, only accepted by USCG
  - Outside US, limited direct market acceptance
IECEx Equipment Certification

Data acceptance options...

- Other ExCB test reports, with audit
  - Compliance with US National differences required
  - Compliance with OrdLoc requirements required
- Witnessed test data
Diversity of certified equipment...

- Active certifications only from early 2000s
- Zone classification system only
- Growing but limited categories of equipment
IECEx Equipment Certification

Applicable Standards...

- IEC 60079 series
- IEC/IEEE 60079-30 series
- ISO 80079 series
- ISO/IEC 80079 series
- Other ISO standards
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NEC HazLoc Equipment Certification

- **Test Reports**
  - Based on US ANSI standards
  - 3rd-party certification regarding OrdLoc requirements

- **Product inspection / audits**
  - Required by federal regulations
  - No fewer than 4 inspection / visits per year

- **Certificates of Conformity (CoCs)**
  - Supported by active test reports and inspections
  - Within US, full direct market acceptance
  - Outside US, broad direct market acceptance
NEC HazLoc Equipment Certification

Data acceptance options...

- Other NRTL test reports, with audit
- Other ExCB test reports, with audit
- Client-generated test data, with audit
- Witnessed test data
Diversity of certified equipment...

- Active certifications from at least the 1930s
- Division and Zone classification systems
- Many hundreds of equipment categories
NEC HazLoc Equipment Certification

Applicable Code, standards and regulations...

- American Petroleum Institute (API)
- Institute of Electrical and Electronics Engineers (IEEE)
- National Fire Protection Association (NFPA)
- Underwriters Laboratories (UL)
- US Codes of Federal Regulations (CFRs), OSHA, MSHA & USCG
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# Comparison of IECEx to NEC Systems

<table>
<thead>
<tr>
<th>Certification Attributes</th>
<th>IECEx</th>
<th>NEC</th>
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<tbody>
<tr>
<td>- HazLoc requirements</td>
<td>- 3rd party certification</td>
<td>- 3rd-party certification</td>
</tr>
<tr>
<td>- OrdLoc requirements</td>
<td>- Self-declaration</td>
<td>- 3rd-party certification</td>
</tr>
<tr>
<td>- Product inspections / audits</td>
<td>- Every 18 months</td>
<td>- 4 times per year</td>
</tr>
<tr>
<td>- Area classification systems</td>
<td>- Zone system only</td>
<td>- Division and Zone systems</td>
</tr>
<tr>
<td>- Product diversity</td>
<td>- Growing but limited, based on active certs since early 2000s</td>
<td>- Significantly broader, based on active certs since at least 1930s</td>
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Thank you!