

## Session 18 – Testing on Ex Equipment



## Certification Issues

### Component Certificates

Recognized test authorities can also certify individual components for compliance with a particular standard. These certified components will normally have “Conditions of Use” specified in the certification document and denoted by the suffix U following the certificate number. These conditions must be observed to maintain the Ex safety design features. Typically the conditions will include creepage and clearance distances, voltage and current ratings and circuit protection. Certified components are normally 100% inspected after manufacture, and where practical, marked to indicate the voltage and current ratings. Many times component certificates apply to flameproof enclosures. OEMs who install additional equipment and wiring inside must then have the enclosure tested to obtain an Ex electrical apparatus approval. Flameproof enclosures normally have a component certificate.

### Apparatus Certificates

A recognized test authority can verify that equipment designed and tested to an appropriate standard complies with all the construction and component test procedures. The manufacturer is then allowed to mark the products with the certificate dates. To maintain a high level of compliance and quality control, the manufacturer will be open to surveillance and audits by the test authority to ensure that the original product design specification is maintained during mass production.

## Certification Agencies

Australia – Standards Associate of Australia SAA Committed P/3 responsible for the standards and tested by either Test Safe Australia or Safety in Mines Testing and Research



Canada – Standards Council of Canada officially authorizes the following certifying bodies to certify equipment for use in hazardous locations:

- CSA International
- ETL Testing Labs
- UL of Canada
- Underwriters Laboratories



Europe – Equipment for Hazardous locations must be certified to the CENELEC Standards prepared by the CENELEC TC31 committee and subcommittees. To keep the standards uniform in all the laboratories, the “Ex Notified Bodies Group” meet once or twice a year to discuss problems and issues and resolve disputes between the labs.

Acceptance of the certification of the laboratories is required by law in all member countries and manufacturers are not bound to use their laboratories in their own country if they choose not to.



## European Notified Bodies

These Notified Bodies will provide third party testing to various international standards and almost all will provide product testing to the ATEX directives.

Austria - TUV  
 Belgium - ISSeP  
 Denmark – DEMKO  
 Finland – VTT  
 France – INERIS, LCIE  
 Germany – DMT, PTB, TUV  
 Italy – CESI  
 Luxembourg - SNCH  
 Netherlands – KEMA  
 Northern Ireland – ISC  
 Norway – NEMKO  
 Poland – INOVA  
 Slovakia - TI  
 Spain – LOM  
 Sweden – SP  
 UK – SCS, TRL, ETL, Baseefa 2001

...and more every day...



## IECEX Certification Bodies and Test Labs

Many of the European Notified Bodies are also in many cases IECEx Test Labs and Certification Bodies. These organizations will provide testing to the relevant IEC 60079 set of standards (TL's) while a same set (or different) organization can provide the certification documentation (CB's)





# Tests on Ex Equipment

Three types of Tests typically done on EX equipment

- Type Test to meet certificate of conformity
- Routine Test on product either individual or batch
- Quality Test – Typical ISO 9001

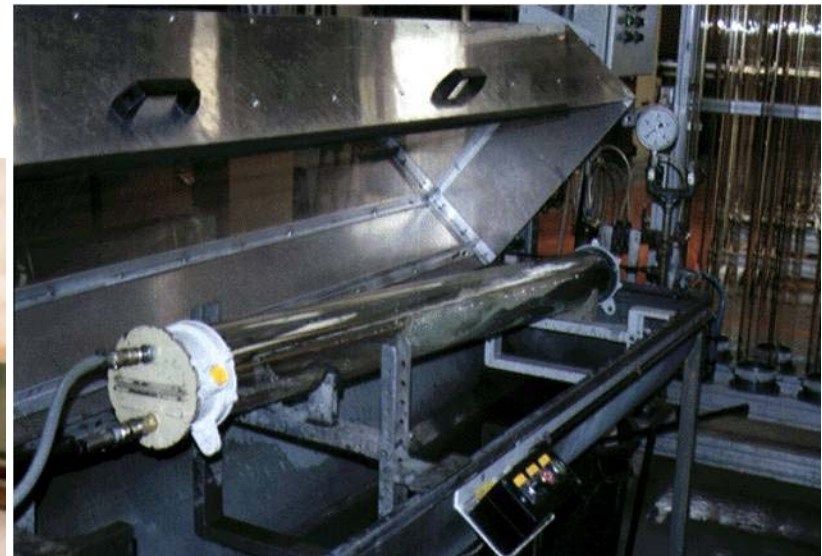


 <b>DET NORSKE VERITAS</b>	
<b>MANAGEMENT SYSTEM CERTIFICATE</b>	
Certificate No. 96-OSL-AQ-6457 This is to certify that THE QUALITY SYSTEM of <b>Øglænd System AS</b> at Stavanger, Norway has been found to conform to the Quality System Standard <b>NS-EN ISO 9001 : 2000</b>	
This Certificate is valid for the following product or service ranges: <b>Design, production and marketing of multidiscipline support systems for electro-, HVAC- and piping installations.          Sales and marketing of heating cables and related products,          and coupling systems for piping.</b>	
<i>Original certificate valid from:</i> 1996-08-06	<i>Place and date:</i> Hovik, 2002-07-31
<i>This Certificate with Appendix is valid until:</i> 2005-08-06	<i>For the accredited unit:</i> Det Norske Veritas Certification AS
Arnfinn Meihack <i>Lead Auditor</i>	 Merete Lange <i>Management Representative</i>
Lack of fulfilment of conditions as set out in the Appendix may render this Certificate invalid.	



## Testing on Ex equipment – Type Test

- Defined by the standards themselves
- Must be carried out by a Notified Body, i.e. SIRA, PTB, NEMKO, etc
- Examples:
  - “d&e” products
    - Impact test – resistance to shocks
    - Temperature rise – temperature class
    - U.V. resistance
  - “d” products
    - pressure test
    - non-transmission test



## Testing on Ex equipment – Type Test

- Gas Turbine Testing Equipment



- Typical Ex 'd' test chamber





## Routine Test

Ex “d” products: hydraulic test (static overpressure ) Can is sometimes is done on the every particular item produced. Usually done where a sample cover with the incoming air hose is mated to the body of the enclosure and vice versa to provide a final product test

Ex “e” products: dielectric test (static overpressure ) Typically is not done on each product produced but is done on a batch basis



## Fire Test



Typical Fire Testing standards for electrical components was directly from both the Piper Alpha explosion in the North Sea as well as the Chunnel fire in the UK. Health and safety regulations require certain products for use in critical areas must meet specific fire testing requirements. IEC has also the same requirements for critical circuits such as IEC331 and IEC332 rating for cables. The specific testing requirements are as followed:

- 1742°F (950°C) for 3 hours electrical supply on
- 12 hour cool-down and retest of safe electrical operation

