The proverbial “Ex bible” in South Africa for hazardous locations is SANS 10108: “The classification of hazardous locations and the selection of apparatus for use in such locations”.

Regulations for explosion protected apparatus for hazardous locations

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It contains invaluable information with respect to hazardous areas and explosion protected equipment (Ex equipment) for these areas.

Under the world trade organisation (WTO) agreement, of which South Africa is a cosignatory, no regulatory requirements may exist in a standard. Therefore, from 2003, reference to regulatory issues had to be removed from standards, including the SANS 10108. This created a challenge as to where to effectively make available the information with respect to certification for hazardous locations in South Africa. The solution was to create a supporting document (ARP 0108) to the SANS10108 document, which must be read in conjunction with the SANS 10108 document. ARP 0108 (first issued in 2005) contained information including listing the relevant and acceptable standards for certification, the accepted test laboratories (TLs)/certification bodies (CBs) and certification, the validity period of the certification, etc.

Legal responsibilities

ARP is the abbreviation for “Aanbevole/ Recommended Practice”. The fact that the abbreviation is for a “recommended” practice should not be construed as meaning that it is optional in its application. The Department of Minerals and Energy (DME) and the Department of Labour (DOL) enforce the document as the mandatory legal certification requirements for hazardous location/Ex equipment. The “ARP” abbreviation is the formal type of title used by STANSA (Standards South Africa) for additional (regulatory) documents (not standards)

that are not controlled by STANSA but published by STANSA. Responsibility for ARP 0108 is taken by the Department of Minerals and Energy (DME), in conjunction with the Department of Labour (DOL).

In this paper, the following terminology has equivalent meaning in this document.

- “Product conformity” and “Certification”
- “Explosion protected apparatus” and “Ex equipment”

ARP 0108: 2007 (Edition 1.1) specified the “Regulatory requirements for explosionprotected apparatus”.

Edition 1 was released in 2005. Edition 1.1 was released 26 March 2007. The updates in Edition 1.1 are limited, but significant.

Committee for SANS 10108

The committee responsible for SANS 10108 was involved in the drafting of the original content of the ARP 0108 as well as the latest edition. The committee consists of members from SAFA (South African Flameproof Association), industry (manufacturers and end users) as well as test laboratories. The content of the document is therefore not the result of a one sided approach taken by the DME and DOL.

Some of the changes made in the ARP 0108 may seem drastic. However, South Africa had a situation for many years where none of the issues, especially re-certification of Ex equipment was addressed. For instance, when does equipment certified to a standard in 1955, and still being manufactured and sold today, need to comply with the latest standard(s)? ARP 0108 is part of the cleaning up process for the situation in South Africa, and as with any change in a process, there will be growing pains. Most of the approaches taken follow principles applied on an international basis, and are not unique to South Africa.

Content and requirements of ARP 0108

This is an abbreviated version of the most important aspects covered by the ARP0108. For the full requirements, consult the ARP 0108 document.

Scape

The scope of the ARP 0108 is product conformity/ certification requirements
for explosion-protected apparatus used in South Africa.

Certification, manufacturing and repairs

Requirements for type testing/type certification/repairs of Ex equipment, as well as batch testing by an approved test laboratory (ATL), or a mark scheme by an approved certification body, are covered in ARP 0108. (The batch testing or mark scheme considers the production of certified Ex equipment.) The end user is required to obtain a copy of the type certificate (containing the SANAS logo to indicate accreditation of the ATL for the specific Ex technique). The approved certification body logo on the product marking, accompanied by a copy of the mark scheme permit and schedule, covering the certificate number of the product, will indicate compliance for the production system under which the Ex equipment was manufactured. Alternatively, if the Ex equipment was batch tested by an ATL, then a test report from the ATL, covering the serial number, must accompany the Ex product.

Repairs are conducted to the original type certification (or standard) by a mark holder or batch tested by an ATL. The end user must obtain the relevant documentation for any repaired Ex equipment, following the same principles as above.

Requirements for labels applied by repairers are included in the ARP 0108. The label fitted by the original equipment manufacturer may not be removed, while labels fitted by previous repairers are removed.

Acceptable reports/certificates

Only certificates/reports from ATLs and approved certification bodies will be acceptable (see amendments section below).

Note: There are three ATLs and three approved certification bodies in South Africa.

All Ex equipment used in underground mines (Group I) and/or on surface (Group II) shall be covered by an IA certificate and shall be marked with the relevant IA number (from the IA certificate).

Note: An IA certificate is issued by an ATL.

All Ex equipment/intrinsically safe systems shall be certified by an ATL to the list of acceptable standards detailed in the ARP 0108.

Note: Any interconnection of separately certified intrinsically safe equipment, or connection of simple apparatus (e.g. a switch) must be submitted to an ATL, and the connection must be approved.

General information with respect to other schemes, including the ATEX directive, the IEC Ex scheme and the North American approach is given.

Upgrading and maintenance of certification

The requirements are covered in Annex C of ARP 0108.

New IA certificates issued shall have a validity period of 10 years. The date of issue and the date of expiry shall be stated on new certificates.

Where a product is in service and its certificate has expired it will not be affected.

IA certificates based on overseas certification will be valid for a period of one year.

There are three ATLs and three approved certification bodies in South Africa.

Equipment with overseas certificates, which are issued with an IA certificate and which is manufactured under an acceptable third party approved quality assurance scheme, is required to be re-evaluated by an ATL on an annual basis.

Note: This is to verify the continuous implementation of the acceptable third party quality assurance system and to ensure that no changes/variations are made to the equipment.

ATLs must re-approve/re-certify any modifications to existing product/designs that will change its explosion protection characteristics. This re-approval/re-certification process will be done to the latest standard and the whole of the equipment must comply with the latest standard.

Note: This requirement may have a significant effect especially on electronic equipment, as changes in standards, as well as interpretations of the standards are progressing on a regular basis. Modifications to some products, especially if some aspects on the equipment do not comply with the latest standards, may therefore not be viable.

The above requirement(s) for modifications are also applicable to changes in intrinsic safety system approvals.

As long as the certificate is still valid, and no changes to the certified design are made, and no unsafe conditions are identified in the earlier standards (unlikely), certified products can be manufactured and be covered by the type certificate (incorporating the mark scheme or batch testing requirements as indicated above).

Existing IA certificates and GME certificates (previously known as V or VM numbers) issued before 1998 shall be valid until October 2010, and those issued after 1998 shall be valid until October 2015.

Note: This validity period is only applicable to products still manufactured under the original certificate(s) and not modified. Existing equipment may be repaired and maintained to its original certification, as described above, and is not affected by the expiry date on the new certificates being issued today, or the ruling for 2010/2015 as indicated above.

A product still in production shall be submitted for re-certification to an ATL before the IA certificate expires so as to achieve re-certification before the expiry date.

Where a product with a valid IA certificate is found to be unsafe for use, the certificate holder shall take appropriate steps to rectify the design of such a product and re-certify such rectified products. Unsafe products already supplied shall be recalled, and both the regulatory body and the ATL (and approved certification body for mark holders) that issued the certificate shall be notified.

Edition 1.1 updates

The updates are minimal, but significant.

Except for some clarification issues, new definitions, inclusion of a marking section with examples, the most significant change is in Annex A: “Approved standards, test laboratories and certification bodies”.

One of the changes in Annex A is the new requirement that only certificates from ATls for all industries will be acceptable, as indicated in the text above. This will be enforced within six months from the date of issue of Edition 1.1 of ARP 0108. This effectively means that as of end of September 2007, no overseas TL or CB test reports/certificates will be directly acceptable for Ex equipment any longer. This includes certificates from Notified Bodies in America and Canada that may have been used directly in the past. This requirement is most significant for surface industry, as the issuing of IA
certificates for Ex equipment for mining has always been enforced.

A second change in Annex A, which refers to tables in Annex B, is the list of acceptable standards. The basic approach is that certificates issued to national standards are acceptable. However, the original list of standards is maintained as “other standards”, with the intention of giving information to the end-user as to which standards may be used as a basis for re-certification. This means that if the overseas certified equipment is submitted, and the certificate was done to the listed “other standards”, then re-testing is not foreseen and a minimal amount of work is expected to re-certify the equipment to the national standards.

Note: One should consider that national standards are based on the IEC standards. The EN standards and the IEC standards are close in their requirements. However, some of the “other standards”, for instance the American standards, may prove to have some significant differences with respect to national standards.

The above requirements do not refer to equipment purchased prior to the September 2007 date, which is still governed by the list of approved TLs/CBs and standards of Edition 1.

Implications of ARP 0108

Some significant deadlines are set by the ARP 0108. It is the responsibility of industry (especially suppliers/manufacturers) to verify the status of the certificates for their products.

The deadline of September 2007 was a rush already, it was impossible for the ATLs to cope with a sudden significant influx of certification conversions.

The deadline of 2010 seems further away than it is in reality, especially considering the amount of work that needs to be done for a re-certification of locally manufactured products.

In addition, end-users must ensure that the correct documentation is available for the equipment they buy. This includes copies of valid certification, the mark scheme permit and a schedule or batch test report (see above).

Process of re-certification

The process of re-certification must be handled with care by the ATLs. This follows the fact that ATLs must be accredited by SANAS, and if a certificate is issued, full traceability is required.

For this reason, as indicated above and in the ARP 0108, previous test results may be used for re-certification, but only as long as it is traceable. Traceability is typically ensured by obtaining a test/assessment report issued by the TL/CB that did the original work. If it is proven that the TL/CB is also accredited by a third party accreditation body (like SANAS), for the technique tested and certified (e.g. intrinsic safety, flameproof, etc.) and the third party accreditation body has a memorandum of understanding (MOU) with ILAC, then the results for the testing can be directly accepted.

Note: SANAS has a MOU with ILAC, which makes the acceptance of TLs results acceptable between all TLs accredited by bodies with these MOUs.

National standards are based on the IEC standards.

IA certificates for overseas certified equipment

A submission to an ATL should include the following:

- The certificate (including its schedules) and all variations to the certificate.
- The assessment report. This report is known as the test report in South Africa, but overseas, the test report is typically a lower level report.
- The South African test report covers both assessment and testing, while overseas they distinguish between the activities/reports.
- The stamped drawings as listed in the certificate. Sometimes difficulty is experienced in obtaining drawings, but this may be resolved by means of confidentiality agreements.
- The third party quality assurance for the manufacturing company. An ISO 9000 certificate does not suffice. The listing or quality assurance notification (QAN) must be from an Ex CB. The certificate must be listed on the schedule for the listing/QAN.
- Proof must be obtained of the accreditation for the issuing TL/CB, applicable to the date of issue of the certificate/report(s).

It is up to the individual ATL if more information than that detailed above is required.

Conclusion

The mandatory regulatory requirements of ARP 0108 has been available now for more than two years, and the document contains some substantial requirements. The most recent requirements of the latest Edition 1.1 are again substantial. The industry needs to be aware of the requirements and their responsibilities with respect to these requirements so as to be legally compliant and active in the process of ensuring safety in hazardous locations.

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