

Respirator Standards and Regulations in Australia

(Presented at the 1987 ISRP Conference in Toronto Canada.)

Olga Pitt

Division of Occupational Health, New South Wales, Australia
Department of Industrial Relations and Employment

Australia, geographically is located very far away from Canada: because of this **isolation**, I regret not being able to be with you today to deliver this paper personally and join in the ensuing discussions. I hope, however, **that** you realize **I am here** in spirit and that Australia, sociologically, is not very distant at all.

Australia is a highly urbanized nation, with six states forming a commonwealth. It's heavy industry, **mining**, manufacturing and **agriculture**, alas create hazards to ensure there is a continuing **need** for respiratory protection.

Prior to 1965 the Federal Government undertook all testing of industrial type of respirators in its Defence Standards Laboratory (not known as Materials Research Laboratory) in Melbourne, Victoria.

It continued **doing** some commercial work for many years, but currently the MRL tests only respirators for use by the Australian Defense Department.

In 1986 the New South Wales State Government established its own laboratory for testing industrial respirators at the Division of Occupational Health, then part of the Department of Health. New South Wales remains the only state government to have any facilities for testing respirators. **Also** in the **mid-sixties**, a laboratory to test respirators for mine rescue use

was established with the New South Wales **Department of Mines**. **Following** proposed new occupational health and safety legislation in 1981, both laboratories became part of what is now known as the N.S.W. **Department of Industrial Relations and Employment**. The two laboratories are separately **run**, but **are** both part of a scientific laboratories complex at **Lidcombe**, a suburb of Sydney. The Division of Occupational Health where I work **tests** respirators for industrial **use** - namely filtering type respirators, and compressed air air-lines and self-contained breathing apparatus. The Mines Safety Section tests carbon-monoxide self-rescuers, liquid, and compressed oxygen as well as chemical oxygen sets. Both laboratories charge fees for the services provided.

Standards

The first standard on respirators was published by the Standards Association of Australia (the **S.A.A.**) in 1963 - a product specification, **AS Z18-1983**. (A code of practice was also published at the same time - **AS CZ11**.) When the Association was first established, local standards were largely based on their British counterparts, (sometimes only changing the title). Hence the first standard **Z18-1963** incorporated largely British Standards BS2091,

BS2617 and BS2577, although it did make reference to the American Standard Safety Code **Z2.1-1959** and several U.S. Bureau of Mines Schedules.

The S.A.A. is an independent, non-government organization that publishes standards through the work of representative committees, along similar lines to the British Standards Institute.

The Standards published are revised at frequent intervals, reflecting technological changes of the product and advances in test methods. In 1968 a new, largely Australian respirator specification and code of practice were published.

Major changes to the specification were based on local work. They include:

Qualitative

- (i) Facial fit testing of masks on a panel of **ten** people, of three major facial size groupings. The requirement for facial testing on a selected panel was based on a limited **anthropometric** survey carried out by Hughes and **Lomaes** working for the NSW Department of Health and published in 1972;
- (ii) The use of CS tear gas (**o-chlorobenzlidenemalononitrile**) as the test aerosol for full facepiece and hood-type

respirators (as **chloraceto-phenane used**) and

- (iii) A requirement that air supplied hoods and helmets have a minimum positive pressure within the **wearer's** breathing zone at a 40 litre/minute volume breathing **rate, as** well as not **exceed-**ing a **specified** noise level.

The next revisions, in 1975, changed the numbering of the Standard to **AS 1716** and included a new section on carbon monoxide **self-rescuers** for use by miners working underground. A **"block stack"** exercise was added to the exercise requirements for breathing apparatus wearers. The 1982 revision incorporated requirements for new technology powered air-purifying respirators, disposables and positive pressure demand breathing apparatus.

Facial fit test for disposable respirators was carried out using CS tear gas (with suitable eye protection provided).

Currently, the entire product standard **AS 1716 is being rewritten, largely** to incorporate the latest CEN draft respirator standards, but still retaining some of its original concepts.

Qualitative facial fit testing is being retained for non-powered air-filtering respirators due to the difficulties seen by the SAA committee in quantitative testing. Another test aerosol, saccharin, is to be introduced in a test protocol based on that in ANSI and the test panel may be expanded to include a larger range of facial sizes based on the test panel developed by **Hackett** of the Los Alamos Scientific laboratories in 1973. A revised standard will be published sometime in 1988. It differs in one aspect to the CEN documents in that it must be applied to complete respirators than component

parts e.g. facepieces and filters.

During the 1968 and 1975 revisions of the product standard, the Code of Practice was extensively revised as well, changing its numbered title to AS1715. Reference to equipment not included in the product standards was made in 1968 in CZ11 and in 1975 in AS175, namely **the** use of oxygen generating breathing apparatus. (To date there is still no specification for this equipment). Concurrently with the 1982 revision of **AS 1716**, the code included a table of nominal protection factors assigned to classes of respirators, based on those published by **NIOSH** in 1976.

The Code of Practice is due to be revised again, once the latest revision of AS1716 is complete.

Apart from publishing standards, the **S.A.A.** operates a scheme of quality assurance whereby manufacturers are licensed to use the symbol of the Association on goods made to a published standard. The scheme is similar to the British Standards Institute's **"Kitemark."** Any manufacturer may claim that his goods comply with an Australian standard and label them accordingly. This is entirely the responsibility of the manufacturer, who must be aware of his liabilities under the relevant State Trade Practices Legislation by obtaining a license from the **S.A.A.** to produce goods to an Australian Standard. However, the manufacturer guarantees that the goods comply with that standard. The **manufacturer's** production and production control facilities are subjected to a **pre-license** inspection by inspectors of the SAA and random samples of his production are tested for the Association at an independent laboratory. (The **SAA** has no test facilities of its own.)

The SAA inspectors periodically inspect the manufacturing process after a license is issued, and may take further samples for testing. Where a license is issued to a foreign manufacturer, the SAA may arrange for another organization e.g. the Underwriter's Laboratories or the **BSI** to carry out audit sampling.

The Division of Occupational Health acts as an independent test authority for the SAA, testing industrial respiratory protective devices as well as safety helmets and eye protectors.

Regulations

Standards and regulations seem to go inevitably hand-in-hand in the field of occupational health and safety. Problems arise when legislators enshrine into law what is considered **"the state of the art"** by practitioners. Standards, both product specifications and codes of practice, change from time to time, reflecting changing technology, work practices and knowledge of health. In the field of respirators, in Australia there has been little direct legislation, and so only minimal problems of this nature have arisen.

As Australia is a commonwealth of states, the Federal government lacks the power to legislate over certain matters. The province of health and safety, for example, is left for each state to decide. Formerly, an advisory body funded by the Federal government, the National Health and Medical Research Council, drafted codes of practice on occupational health matters that could then be adopted into legislation by each State. Recently, the National Occupational Health and Safety Commission, known also as Worksafe Australia, was formed to expand this role, drafting safe work practices by tripartite

agreement between **unions**, **employers** and state government.

Each state administers its own occupational health and safety **legislation**, through a variety of **differently** named departments. The detail and scope of this legislation varies. **Generally**, reference is made to the use of respirators obliquely, sometimes calling up Australian Standards **1715** and **1716**.

One glaring little anachronism exists on a little-known piece of New South Wales legislation. The Refrigeration Regulations (written in 1942) call upon the use of "**gas helmets**," (sic). Technically the regulations are still law, but they obviously are not being currently observed.

Other regulations covering respirators **in** N.S.W. **are** far more practical and refer to the use of respirators "**approved**" by the Chief Inspector of Factories, Shops and Industries, or the Chief Instructor of Construction Safety. Similarly, the Coal Mines Regulation Act (**1982**) refers to the use of "**approve**" protective equipment to be used at a mine. A system of approvals is **the** most flexible way of ensuring appropriate equipment is used taking into account up-to-date technology, rather than writing **specifications** into regulations.

Under N.S.W. legislation, two systems of approval (dating back from when the relevant acts were administered by two different departments) have been set up. Mostly, when an item is approved for use in mines rescue, it is almost automatically approved for industrial use. The reverse is also true, with the provision that **the** item **must** be **safe** for underground use e.g. the respirator should not contain any exposed aluminum components, to reduce the hazard of producing sparks, which could trigger an explosion.

Industrial

The rest of my discussion will relate to the scheme of approvals for industrial type respirators, but my comments are probably relevant to both. The approval by the Chief Inspector of an **item** of protective equipment, not just respirators, covers its performance and compliance with the relevant standard and its **conditions** of use. For respirators the terms of approval tend to be very broad, and always refer to AS1715, (the Code of Practice). The approval system also covers other items of personal protective equipment such as eye protection and safety helmets. Each approval is numbered and a register kept. A list of currently approved respirators is published and updated at regular intervals. (A new list should be completed by the end of this year). While the "**occupier** of the **factory**" or the employer has the primary responsibility for supplying approved equipment when required, and seeing that it is used correctly, it is the manufacturer or equipment importer who usually applies for approval. Certain items, e.g. cartridge-type respirators, and safety helmets, in order to gain approval, **must** be licensed by **the S.A.A.**

Other States of Australia generally accept N.S.W. approvals. In Victoria, the Department of Employment and Industrial Affairs operates a separate scheme to approve respirators specifically against asbestos. Each respirator is examined for ease of **cleaning**, including ease of assembly but no testing further to that carried out in N.S.W. is done.

The New South Wales system of approvals **has** been in operation now for twenty-five years. The terms "**D.L.I.**" (Department of Labour and Industry) and now "**D.I.R.E.** (De-

partment of Industrial **Relations** and Employment) approve" have gained wide acceptance among health and safety professionals, not just in New South Wales, but **Australia-wide**. The Department regularly receives telephone enquires from interstate and even New Zealand about whether a particular **item** is approved, and under what conditions.

There have been, and there still are, problems in the operation of the approvals scheme. They are probably familiar to many of you in the audience, from experience in your own country. I would like to conclude **today's** talk with a brief discussion of them.

Problems

The first question concerning any approvals system is whether the article tested (and found to comply with a product specification) is identical to the one that will be sold. To this end, each approval has written into it, the provision that any change to the **product** "will render the approval null and void." To give this provision more force, the requirement to be licensed by the SAA was introduced for certain products, as explained above. It is envisaged that this requirement **will** be extended in the future to cover other types of respirators.

Given **Australia's** geographic isolation, and small population, the question frequently arises, as to what degree should we accept approvals granted by overseas authorities on respirators not made in Australia. The problem is really threefold:

- (i) Is the overseas standard similar to **AS1716**? Are the differing requirements of any real significance?
- (ii) Is there a test report from a reputable laboratory?
- (iii) What reliance **can** be placed

on the **manufacturer's** quality assurance?

Unfortunately, in most cases there continues to be a need for **retesting** foreign made respirators. For **example**, a **NIOSH** certified dust and mist respirator may readily pass the relevant Australian filtration requirement, another one, similarly certified will fail miserably. (The answer to this conundrum lies in the different test methods, one for almost instantaneous filtration efficiency against a fine aerosol, the other one testing filter loading capacity as well as efficiency against a coarser aerosol.)

Sad though it is to relate, some overseas manufacturers have attempted to **"dump"** poor quality products onto the Australian market. Whether by intention or merely bad management, they have shipped superseded models of respirators to Australia that were **not** up to the standards required in their own countries. Some have claimed non-existent **approval** from foreign authorities, gambling on **Australia's** isolation, and hopeful of our ignorance.

It should be said that some classes of equipment are consistently well-made. Self-contained breathing apparatus, needing to pass the stringent DIN requirements, usually is found to be of a high quality. It is not **"automatically"** approved, however, as certain Australian requirements such as exhalation resistance still differ from their European counterparts.

Another problem that an approvals system gives rise to is determining how long the approvals should last? The approvals contain no **"sunset clause"**. The provision, mentioned above, that any changes to the product renders the approval null and void, in effect has given the approval authority the right to review the terms of approval each time the product is altered. With an old product, no longer

sold, how long should the approval remain in force? A high price item such **ass.c.b.a. may** be purchased for use in emergencies and stored with minimal use for many years. Should its approval be withdrawn? If so, when? This problem is yet to be tackled formally.

At present equipment known to be no longer sold is being omitted from the published lists of approvals. It is proposed to begin a systematic program of reviewing old approvals and withdrawing those where the equipment would meet the current standard specification based on altered test criteria from the time it was originally **approved**. Where the standard requirements have been little altered, but the approval is older than 10 years, it is proposed to **retest** the item.

Finally, what can be done about respirators being sold that do not pass any standard and are not approved for industrial use? This falls outside the direct scope of occupational health and safety legislation. Rather, in N.S.W. the Consumer Protection Act of 1969, only allows the sale of filtering type respirators that do not conform with AS 1716, if they are labelled as being **"suitable against nuisance dusts"** and not to be used for toxic or hazardous dusts such as asbestos.

In **conclusion**, all the noble sentiments of legislation and the careful wording of technical specifications are to no avail if the end **user**, the worker engaged in a process generating a respiratory hazard is still insufficiently protected. Somehow governments must ensure that the right respirator, is used in the right way for the job. Perhaps I could quote Thomas Jefferson: That government is best which governs the least, because its people discipline **themselves.**"

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