



The Quest for Safe Energy Efficient Electric Motors

By Vince Higginbotham, Testing Manager, TestSafe Australia

Electric motors power our industries, and it comes as a bit of a shock to find that the energy used by them accounts for 13% of Australia's greenhouse gas emissions. Indeed, 58% of electric power generated by our power stations is used by these motors, including both the large three-phase industrial workhorses as well as small common household appliances. Over the lifetime of an electric motor, the cost of this power will be 100 times greater than the initial motor cost.

There is now strong community pressure to reduce greenhouse gas emissions, and the Australian Greenhouse Office (AGO) a Federal Government Agency, is driving initiatives to reduce emissions with energy efficient electrical appliances. One of its targets is the electric motor industry, and it has devised a National Appliance and Equipment Energy Efficiency Program (NAEEEP), which, by legislation, will require this industry to implement minimum energy performance standards by 2006. Changes to the minimum energy performance standards (MEPS) will result in low efficiency motors gradually being withdrawn and incentives for high efficiency motors to be used. AS/NZS 1359.5 will be the basis for testing and determining electric motor efficiencies in Australia.

However, in this quest the AGO has encountered an initial major difficulty in that there is currently no independent NATA-accredited testing facility to undertake the task of verifying the energy efficiency of these motors. Major electric motor suppliers have stated that they are

only prepared to release their motors, on the grounds of commercial confidentiality, to an independent laboratory rather than one associated with an industry competitor.

This is where WorkCover's TestSafe Australia becomes involved, as it has had a long standing focus on establishing the safety of electric motors. Invariably, there is also a close correlation between a safe electric machine and an efficient machine. TestSafe's purpose-built On-Load and Explosion Protection Laboratory at Londonderry, was opened in 1985 by the then NSW Minister for Industrial Relations, Pat Hills. The facility has its own electrical sub-station and capacity to replicate mining and other high voltages in a testing environment, which provides it with a comparative advantage in the testing of these motors. It has at its disposal, a reliable, pure, standalone, power source with which to accurately conduct a wide range of electric motor testing.



From L to R: Jim Bes, Senior Technical Officer and Henry Huynh, Senior Electrical Engineer determining the set up for the first small motors due for testing

The bulk of electric motors are now manufactured in South-East Asia, and one supplier has submitted two small motors to TestSafe so that it can commence the process of establishing the necessary instrumentation and procedures to achieve NATA accreditation, and provide a valuable resource for manufacturers, suppliers and regulatory authorities. When fully operational, it is expected that the facility will be able to test as many as 100 motors per annum with power ratings up to 150KW.