

EN ISO 11011: A solution to an age old dilemma?

The European Union is becoming increasingly concerned about the challenges faced by member states from their dependence on energy imports, scarcity of supply and the need to limit climate change.

As a consequence a new directive (2012/27/EU) has been issued on Energy Efficiency, from which Articles 7 and 8 were implemented by the UK Government; these being the Energy Efficiency Obligation Scheme (EEOS) and the Energy Saving Opportunities Scheme (ESOS), both of which are operated by the Energy Institute.

It should be noted; however, that at this time ESOS is applicable only to companies in excess of 250 employees, or less than 250 employees if turnover is greater than 50 million Euros or with a balance sheet in excess of 43 million Euros. In this respect each qualifying ESOS participant must, by December 2015, have carried out the following:

- Estimated its total energy consumption from buildings, processes and transport
- Appointed a Lead Assessor to review the chosen routes to ESOS compliance
 - o OR - Comply by adopting BS EN ISO 50001 Certification.

After digesting the above, and as an end user, you may have breathed a sigh of relief because you fall outside these criteria, perhaps thinking that life can go on as normal...or is that really the case? Try replacing the words 'energy efficiency and improvement' with 'reducing annual costs' and the issue may suddenly become a great deal more interesting.

As you contemplate your existing compressed air systems can you honestly say what the annual running costs are, or how much leakage there is, or whether the plant/equipment is still suitable and fit for purpose? The list goes on and whilst these



are not new issues or concerns the above legislation is beginning to throw a spotlight on the energy efficiency of compressed air systems. It will become increasingly the case that the industry has to address energy savings and conservation. This presents an obvious and understandable question, as an end user how do I do this and what do I do with the results? In the past such assessments were either not done at all, or relied on non-standardised procedures and tests, some of which could be entirely unsuitable, inaccurate and overly expensive and non-productive.

The applicable international standard for specifying the requirements for establishing, implementing, maintaining and improving an Energy Management

System (EMS) is ISO 50001, with BS EN 16247-1 specifying energy audit good practice and ISO 50002 detailing energy audits requirements with guidance for use; however, with the introduction of ESOS BCAS became aware that a process specific standard was needed for the assessment of the energy efficiency of compressed air systems. As a result, and following extensive consultation with BCAS members, BS ISO 11011 was produced and published. This was subsequently adopted as an International Standard EN ISO 11011 and it sets the requirements for analysing the data from the assessment, reporting and documentation of assessment findings and identification of an estimate of energy saving resulting from the assessment

process. The standard identifies the roles and responsibilities of those involved in the assessment activity and it considers compressed air systems as three functional subsystems:

- Supply, which includes the conversion of primary energy resource to compressed air energy.
- Transmission, which includes movement of compressed air energy from where it is generated to where it is used.
- Demand, which includes the total of all compressed air consumers, including productive end-use applications and various forms of compressed air waste.

This provides a structured framework for the analysis of data, reporting and documenting of the findings. The outcome is an identification of an estimate of energy savings resulting from the assessment process, or, in simple English – how to reduce your costs! EN ISO 11011 can be used even if you are outside the ESOS scope and is therefore a very useful ‘tool’ for the industry.

The standard determines the methodologies to be applied, which shall include one or more of the following techniques:

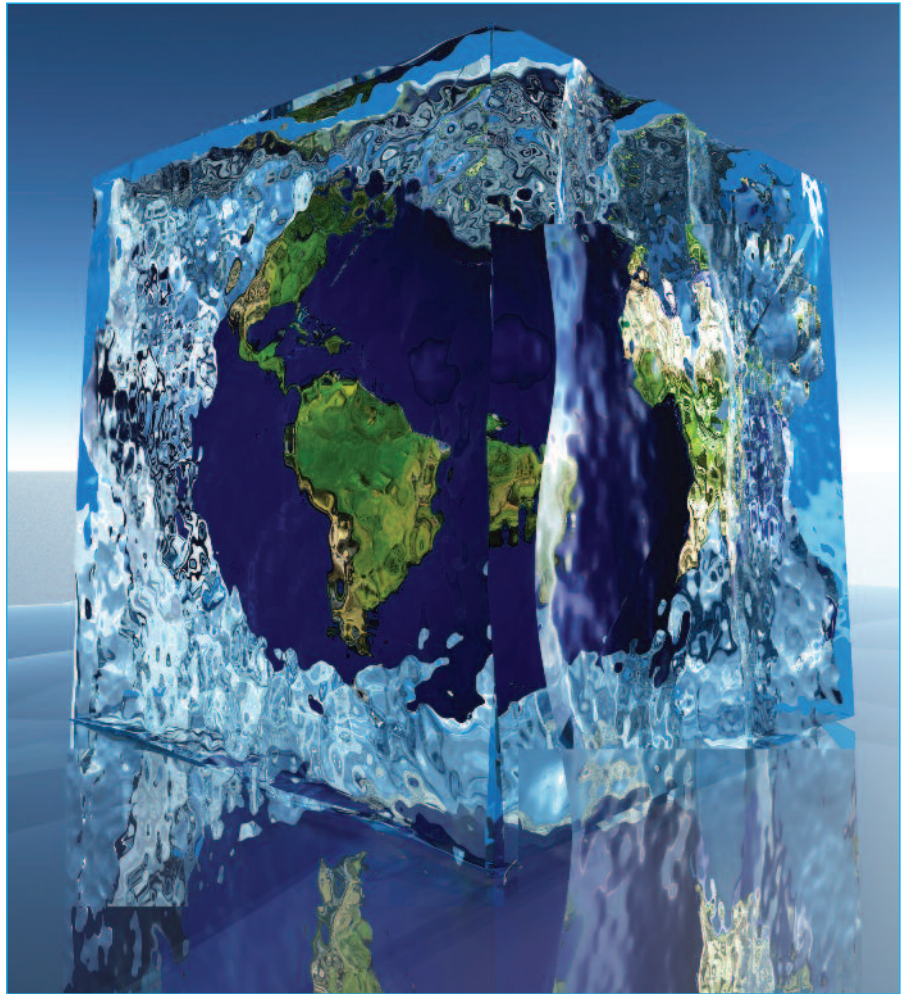
- 1. Observation and research
- 2. Spot check measurements
- 3. Data logging, including dynamics and trend

It also identifies and determines the following:

- 4. Terms and definitions
- 5. Roles and responsibilities
- 6. Assessment methodology
- 7. Parameters and their determination
- 8. Initial data collection and evaluation
- 9. Analysis of data from assessment
- 10. Reporting and documentation of assessment findings

Common System Concerns and Issues

It must be understood that because each compressed air system is different, for example age, location, use etc. that the subsequent requirements for assessment in accordance with EN ISO 11011 will also be different. The standard is therefore intended to be used as required by the assessor/user and the different methodologies can be employed as appropriate, either in part or in full. For example it may not be necessary to carry out extensive data logging, as simple observations and existing available data may be sufficient to complete your assessment. A whole system approach should be adopted though, to ensure



maximum benefit from the assessment process.

What is clear is that EN ISO 11011 now provides the methodology to assess, record and achieve real life cost savings in the running of your plant. The process would typically commence with a full assessment of the system, the scope being determined by you, the user. This could include compressed air use, production functions, poor performance, waste, supply, demand balance, energy use, total compressed air demand and utility bills. Once the scope is agreed the collection and recording of the data can then commence.

From the completed assessment it should be possible to determine, for example, the leakage rate. Given that some systems can have a leak rate in excess of 40% this is a serious issue and a considerable cost penalty. To put this into perspective a leak of just 3mm could cost more than £700 a year in wasted energy. It will also help to establish if you are using the right compressor and/or air receiver, if the system pressure is unnecessarily high (a reduction in pressure of 1 bar can lead to 7% savings in energy), are you possibly over-treating your air which also requires a lot of energy. Possible solutions can then be considered, to include

the repairing of leaks and a leak management program, the upgrading of equipment, improved process control and the use of variable speed controls. In highlighting all these elements ISO 11011 will provide you with a framework to accurately assess where, and how, improvements and energy savings can be made.

It is understood that as an end user you may not have the time, capacity and experience to conduct an assessment yourself and to that end several BCAS members are now in a position to offer a third party assessment service, in accordance with EN ISO 11011. The purpose of this article is to give you, the end user, an understanding of the current requirements and to enable you to make an informed decision as to the scope, content and clear benefits of any assessment that you may wish to carry out or commission.

In summary, and in the words of Lord Kelvin in 1883, “if you cannot measure it, you cannot improve it”, EN ISO 11011 is your solution to this age old dilemma.

Further reading is available at: https://efficiency.energyinst.org/__data/assets/pdf_file/0005/111002/ESOS_Screen_final.pdf