

ATEX Directive 94/9/EC and its application to steam turbines

1. It was accepted by all concerned that:

- Steam turbines on their own are not normally placed on the market as a single functional unit but are generally incorporated with other machinery before they can function, and will only function as intended once they are properly installed.
- Since 30 June 2003, manufacturers and users of steam turbines placed in a potentially explosive atmosphere need to comply, in addition to the machinery directive, as appropriate with the requirements of both ATEX Directives 94/9/EC and 1999/92/EC respectively – relating to design and manufacture of such equipment and the health and safety of workers potentially at risk of explosive atmospheres.
- Other equipment installed near or with steam turbines may give rise to a potentially explosive atmosphere in the vicinity of the turbine (e.g. if gaseous hydrogen being used as a turbo-generator coolant, is released and mixed with the air, the mixture may give rise to an explosive atmosphere and thus a zoned area, which may encroach upon the turbine).
- Additionally other sources of potentially explosive atmospheres may also exist, e.g. lubrication oils.
- In normal circumstances, a steam turbine could have hot surfaces above the auto ignition temperature of the external potentially explosive atmosphere. The surface temperatures depend on the temperature of incoming steam which is supplied by an external source such as a boiler.
- A steam turbine which has surface temperatures that can lead to the ignition of a potentially explosive atmosphere cannot comply with the relevant provisions of directive 94/9/EC. In such circumstances additional measures are required.

2. Given the above, the obligations of the manufacturer and user of steam turbines need to be considered. **It should be noted that in all instances of the following guidance the general concepts described in chapters 4.1.2.3 and 4.1.2.4 of the Guidelines on the application of directive 94/9/EC will apply (e.g. ATEX compliant equipment must be used, where applicable, inside machinery).**

- The manufacturer can ATEX certify the steam turbine for use in external potentially explosive atmospheres with auto ignition temperatures above the specified maximum steam inlet temperature.
- Although manufacturers must, to the state of the art, eliminate or control sources of ignition, it may not be technically possible to reduce the temperature of all hot surfaces to comply with the Essential Health and Safety Requirements of the ATEX Directive 94/9/EC.(1)
- The main measure for safety is to prevent the explosive atmosphere from being in contact with the hot surfaces of the steam turbine, e.g. by an over-pressurised enclosure.

- A supplier (this may be the turbine manufacturer, packager, installer, final supplier, etc. and in some cases the end user) delivering steam turbine machinery and associated safety devices is responsible for risk assessment and implementation of the chosen basis of safety under Directive 94/9/EC. Irrespective of the chosen basis of safety if there is the potential for an explosive atmosphere to arise near the turbine, and proper consideration should be given to minimising the risk of ignition. The supplier as described above is also responsible for the communication of instructions for safe use and any residual risk to the end user sufficient for the completion of risk assessments under the relevant work place directives.
- Interested parties should consider Chapter 3 of the Commission guidance on the ATEX Directive 94/9/EC, which provides further information on the relevant responsibilities.

3. In full application of the above guidance, a steam turbine **as a complete machine the ignition sources of which have no interface to a potentially explosive atmosphere outside the enclosure** does, however, not fall under scope of the ATEX Directive 94/9/EC and as such cannot be affixed with the special marking for explosion protection and other marking detailed at Annex II, EHSR 1.0.5. of the Directive.

4. It is evident that a steam turbine delivered as a complete machine by one supplier is considered to be an assembly in the sense of directive 94/9/EC and shall be marked accordingly, if it is **intended to be used in a potentially explosive atmosphere**.

(1) Annex II, EHSR 1.3.1 "Potential ignition sources such as ..., high surface temperatures, ..must not occur".

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