

Position on a possible obligation to define assemblies according to the Pressure Equipment Directive for incorporation into complex machinery (2020-03-06)

Complex machinery, like e.g. turbine generators include a considerable amount of pressure equipment. Each piece of pressure equipment comes with its own conformity assessment. The pressure equipment is carefully selected, in particular with respect to the overall design and safety integrity of the machinery. However, in most cases, it is not possible or at least useful to define assemblies of pressure equipment within the machinery for the following reasons.

- The pressure equipment incorporated into the machinery is supplied by a multitude of vendors, i.e. they are not placed on the market and put into service as an integrated and functional whole. Therefore, it would not be possible to define assemblies such that the manufacturer's responsibility for the conformity assessment of the assemblies could be assigned to an individual entity
- Definition of assemblies aligned with the scope of delivery of the respective vendors would be equally inadequate as their scope of delivery is usually not consistent with the process flow or functional arrangement (i.e. it does not constitute an integrated and functional whole) of the pressure equipment internal to the machinery
- As a consequence, the obligation to define assemblies of pressure equipment would involve in complex machinery systems the need for multiple conformity assessment of the same pressure equipment. Along the entire supply chain, there would be a need to do the conformity assessment not only for each piece of pressure equipment, but also to define assemblies of pressure equipment at several stages of the supply chain, for which again a conformity assessment acc. to PED would be required.

The result would be a confusing and untransparent bunch of chained, stacked or nested conformity assessment procedures, not consistent with the definition of an assembly (Article 2, para 6) and the intent of Whereas No. 7 of the PED. Ultimately, this could end up with the whole machinery being considered as an assembly according to PED, which would be a totally inadequate conclusion with respect to its intended function and overall design criteria for the machinery. As such, this would clearly go against the intent of Article 1, para 2(j), as well as Guideline A-11. All this will just add a lot of bureaucratic burden to the manufacturers, as well as considerable cost to the products, but not improve the safety of machinery in any respect

Whenever pressure equipment is incorporated into complex machinery systems, the best way to adequately handle the hazards associated with the incorporation of this equipment is to have the machinery manufacturer carefully assess all relevant hazards, having regard to the specific configuration of and interactions internal to the machinery. This is a manufacturer obligation, called out and well established in the European Machinery Directive 2006/42/EC. This concept has proven over many years to effectively ensure a very high level of overall

safety for machinery and also complex arrangements, also with respect to pressure related hazards. In contrast to this, the arbitrary creation of assemblies of pressure equipment may even impair the machinery manufacturer's ability to do a proper overall risk assessment for the machinery, as the boundaries of these assemblies will usually not be consistent with the actual process interfaces and interactions.

Moreover, it must be stated that there is no evidence whatsoever for the existence of unacceptable pressure related hazards emerging from machinery that has been conformity assessed according to the Machinery Directive.

Finally, all machinery systems are subject to a final assessment by national authorities before they are allowed to be put into service (Art. 5 of Directive 2009/104/EC¹). This will ensure that any pressure equipment has been adequately installed, can be operated safely, and the whole arrangement does not present additional hazards.

As a conclusion, it must be stated that a complete chain of effective measures to ensure the overall safety of machinery, as actually built and operated, is already in place. No additions are needed. Any obligation for the definition of assemblies of pressure equipment would impose undue bureaucratic burden and cost to manufacturers but will definitely not improve the safety of machinery.

¹ DIRECTIVE 2009/104/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 September 2009 concerning the minimum safety and health requirements for the use of work equipment by workers at work (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)
OJEC L260 of 3 October 2009

Examples for the conformity assessment of pressure equipment incorporated in complex machinery

Combined Cycle Turbine Generator

The following graphic illustrates the conformity assessment procedures already to be performed today for complex machinery systems, such as a utility turbine generator including and electrical generator, a gas turbine and steam turbine.

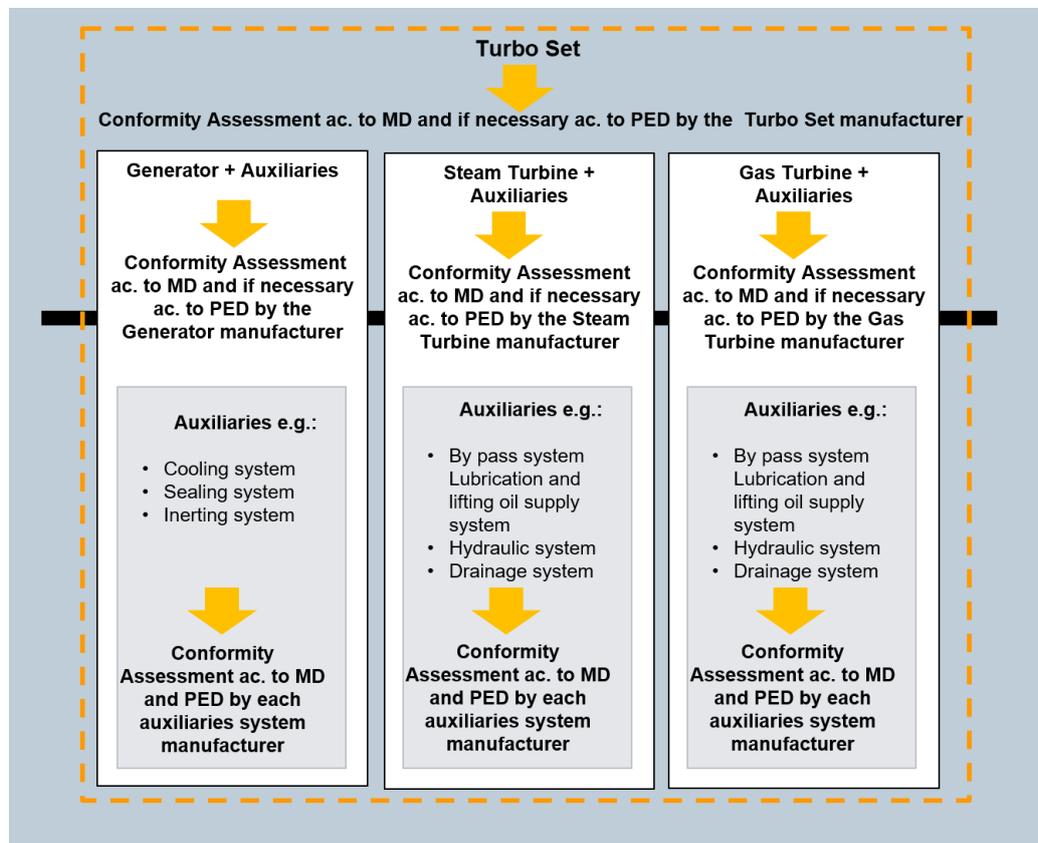


Figure 1 Overview over the conformity assessment procedures to be performed for a combined cycle turbine generator

In this example, the mentioned systems include several pieces of pressure equipment, which usually not supplied by one manufacturer as an integrated and functional whole. Instead, the pressure equipment is incorporated into the machinery by the manufacturer of the machinery to contribute to a certain function necessary for the overall functioning of the machinery and not mainly targeted at the enclosure or guidance of pressurized fluids. This demonstrates, that in this case there is no way to form assemblies of pressure equipment, for which a meaningful conformity assessment could be performed.

Cooler System for industrial turbines

Affected products

Turbomachinery (gas turbines, steam turbines, compressors) with interconnecting piping to pressure equipment according to PED.

Situation

- A cooler (cat. IV) (purchased component) is connected to the core machine.
- The interconnecting piping is self-manufactured (cat. III or less).

Current approach:

- The cooler has already been subject to the conformity assessment performed by the cooler manufacturer and comes with an appropriate EU Declaration of Conformity and CE marking.
- Conformity Assessment according to PED requirements is performed for the interconnecting piping.
- The connection of the core machine with the self-manufactured piping and the purchased equipment (i.e. the incorporation of the pressure equipment into the machinery) is also evaluated by the machinery manufacturer in the course of the overall conformity assessment of the complete machinery in accordance with the Machinery Directive.
- Before putting into service, the machinery is subjected to a final assessment by national authorities to verify appropriate installation and suitability for safe operation

If changes in PED Guidelines are realized:

- If everything is assumed to be an assembly acc. to PED, an additional conformity assessment procedure would have to be performed for the assembly. This would be on accordance with the highest category of the included equipment (cat. IV in the presented case), which would mean excessive effort in relation to the pressure related hazards actually emerging from the machinery.
- The additional involvement of a notified body and increased manufacturer internal effort would exclusively be targeted at re-considering pressured equipment that has already been conformity assessed at an earlier stage.

Effects

- The evaluation according to a higher category does not lead to a higher safety level.
- The inspections are the same but lead to more effort if a notified body is involved.
- Higher costs and prolongation of projects are expected.

This example demonstrates that the additional cost and effort associated with a possible obligation to define assemblies of pressure equipment, does not add any value to the well-established chain of conformity assessment and inspection activities already performed today to ensure the overall safety of complex machinery.

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