

# Why should reticulated clean steam be considered for sterilisation?

With many Health Service Organisations (HSOs) looking at making the change to clean steam for sterilisation, the question becomes; what is the best way to implement clean steam?

Replacing existing sterilisers with ones which have on-board steam generators is an easy option, however there are also advantages of considering the use of standard sterilisers supplied by a reticulated clean steam system. The merits of the latter are explored in more detail below.

Reticulated clean steam would usually mean installing one or more Clean Steam Generators (CSG's) in a nearby plant room and reticulating the clean steam to the sterilisers in the CSSD (and possibly also to the Theatres to provide clean steam for humidification as well). A standalone CSG, while compact in design, does not have the same size constraints as an on-board generator, which must fit within the confines of the steriliser framework. This can be an advantage when considering the design features that help to produce the steam quality required.

Steam dryness is largely down to the generator steam disengagement design, which includes adequate water surface area for steam release, enough distance from water surface to steam take-off and effective moisture and droplet separation in the take-off. A standalone CSG, which has less constraint on size, and thus can use a larger generator vessel, is more able to take all these factors into consideration and be sized and designed to deliver steam with high dryness. In addition the larger vessel holds more water and acts as an energy store that helps maintain a more constant steam pressure under the high peak steam demands of the steriliser (EN 285 and ISO 17665 recommend that steam pressure should not vary by more than 10%).

Non-condensable gases (NCG's) are controlled by degassing of the feedwater. An adequately sized heated and vented feedtank, with sufficient elevation to prevent feedpump cavitation, is more easily incorporated into a standalone CSG to provide effective degassing of the feedwater.

Space in the CSSD is limited and sterilisers tend to be installed very close together with minimal distance between adjacent units. This can make inspection and maintenance of on-board steam generators difficult and possibly even a risk (confined and awkward working space, hot surfaces and electrical and control equipment are but a few considerations). A standalone CSG installed in a plant room, where there is generally more space available, makes the CSG more accessible and also means that inspection and maintenance of the generator are done in the plant room, rather than in the confines of the CSSD. This will result in less disruption to the CSSD area and of course eliminates the risk of hazards and potential contamination within the CSSD, in particular clean and sterile areas, due to any maintenance and inspection work done on the generators. Further the plant room climate control is less critical, and often done by ventilation, whereas climate control of the CSSD is critical and the heat load that results from the operation of on-board generators adds to the CSSD air conditioning requirements and running costs.

Steam quality and purity testing needs to be done as part of IQ or OQ, and there after annual purity testing is required (EN 285 and ISO 17665, which are normative references to AS/NZS 4187, also recommend annual steam quality testing). This means that test points must be installed, and if the testing is to be done in accordance with EN 285, the test points must be within the requirements of the standard (for example 400mm straight horizontal pipe before the dryness pitot tube insertion point). On-board generators tend to have compact pipework, for which installing suitable test points can be a challenge, and sometimes not possible (if done in accordance with the standard). Also each on-board generator is a separate steam source so will need annual testing, meaning multiple tests need to be done each year. With reticulated clean steam the pipework can be designed to incorporate the test points at point of use, and as the steam system is supplied from a common source (even if multiple CSG's are used), annual testing could involve as little as one test at point of use. Less tests means lower costs and less disruption in the CSSD, when the tests are done.

If existing sterilisers are compliant then upgrading to clean steam can be done without replacing the sterilisers, as a reticulated clean steam system can be used to supply existing sterilisers. In general, the expected life of a steriliser is likely to be less than that of a robust standalone CSG, so for on-going steriliser renewal / replacement, a steriliser using reticulated clean steam will be lower cost to replace compared to a steriliser with an on-board generator.

For more information, please contact Spirax Sarco on 1300 774729 (SPIRAX) or [info@au.spiraxsarco.com](mailto:info@au.spiraxsarco.com)

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