

Cleanliness of the installations does not only apply to the daily routine. There are very few theatres where rubbish from the building construction works has not been left behind underneath the elevators and in other technical spaces. This kind of dirt does not match very well with precise mechanical components or electrical or electronic installations. There is a good reason to take care that places outside the immediate stage area are also kept clean – the service technician crawling out from underneath the elevators would enjoy not looking like a chimney sweep! But first of all keeping the spaces clean will help to guarantee the reliability of the whole automation system.

Once the theatre has been handed over to the user, it is up to the operator and the staff to decide when and to what extent maintenance work on the system is carried out, so we should now talk about the objectives of maintenance. These objectives are the reliability of the whole system, maintenance of its value and of its safety, for performers, audience and staff – but can all these goals be reached by maintenance alone? Let's have an example.

A hoist machine has not been used throughout the last year. According to the manufacturers, modern brakes are almost maintenance free and therefore need not to be considered during routine maintenance. Can you be sure that the brakes will work safely? Is the required safety level ensured irrespective of any maintenance? Certainly not! The necessity to keep up a high safety level derives from the fact that work on stage takes place intentionally and for operational reasons below suspended loads, often within the travelling range of machines or on mechanically-moved podiums. And let's face it, even a knight's armour would not be sufficient protective clothing; therefore we must pay special attention to the issue of safety and ask ourselves what inspections or tests are necessary to guarantee it.

The operator is obliged to take care of all the safety aspects of his premises. This includes the observation of the relevant laws, regulations and rules; for example, accident prevention regulations. If you look at the relevant DIN standards for performance areas, we see that there are quite a few of them and quite a lot of issues to consider. So some guidelines would be helpful that could give a hint about how to deal with all these requirements.

At this point, it is surely no surprise to you when I say that we have guidelines in Germany giving any employer and owner the duty of conducting periodic testing of his stage and safety facilities. This is stipulated in the regulations of the statutory accident insurance. These are binding on any operator, private or public. The regulations specify the time intervals between inspections and tests, the person entitled to make them, the scope of inspections and how to document these.

According to these regulations, periodic tests are compulsory. This means that each complete system is to be retested at regular intervals by applying the same procedures as the tests which were performed on the original acceptance of the system. The employer must ensure that safety and mechanical equipment is tested by a competent person at least once a year and by an expert at least every four years. The expert must be authorised by the German Statutory Accident Insurance for testing. This procedure is very specific and cannot be easily adopted in other countries, simply because the relevant regulations do not exist. So I want to focus on the testing by a competent person.

A competent person is someone who has adequate knowledge and experience in the field of safety and mechanical equipment, is familiar with the relevant state occupational health and safety regulations and so on, and who also has competence relative to the standard of a competent person. Competent persons can be found inside the theatre or outside, or specially trained persons or manufacturer's technicians.

In Germany the testing of the mentioned systems have been entrusted to the testing of their systems almost exclusively to stage engineering companies. But still there is no duty to carry out maintenance; that is just about zero, and the regulations are just about inspections. And the reasons why the stage engineering companies are doing the maintenance together with the inspection is that all the components are maintained by their specialists and this work being done by external engineers prevents the possibility of a conflict of interest in the



An installation of vertical spindle drives for flying bars – typical of an installation that must be well planned to allow future maintenance

Photo: SBS Bühnentechnik GmbH

Potentially dangerous equipment does not always get inspected or maintained. Bill Sapsis of Sapsis Rigging, Mark Ager of Stage Technologies, Frank Sturmheit of SBS Bühnentechnik, Ken Golding of Delstar Engineering and consultant Mark Priestley examine how stage equipment should be looked after.