

## The SBR-Construction Kit Standardises the International Construction of Sewage-Treatment Plants

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Time and money are the two main limiting factors affecting competition in the international construction of sewage-treatment plants, and their influence continues to increase. Although German environmental technology has an excellent international reputation, high-tech engineering solutions from Germany are difficult to sell, particularly in the new EU states and neighbouring countries, because of the complex technology and high costs they involve. Flexible and economical solutions from Lithuania, Turkey and other low-wage countries are gaining increasing importance in the fast-growing market for environmental products in Eastern Europe.

The volume of turnover in the German environmental sector has declined in the past few years in spite of good growth rates in many sectors (in particular of waste-water treatment). The medium-sized companies concentrating principally on the German market have had to struggle hard against the decline in achievable prices on the market for municipal sewage-treatment plant. This has resulted in the disappearance of many companies with a record of success going back over decades.

A similar but even more serious development has been seen in the engineering-consultancy sector. In order to counteract the negative trends of the past years, many manufacturing and consultancy companies have been trying to gain a footing on the growing overseas markets for

water and waste-treatment technology. They have not always been successful. Besides overcoming language barriers, it is essential to create confidence as well as contacts with reliable local partners. Many companies assumed that with the right products, services and suitable partners it would be possible to do business in the same way as in Germany. It was also taken for granted that more complex and turn-key projects could be handled in exactly the same way, that projects could be treated in isolation and that the various stages of planning and implementation could simply be transposed to the new environment. However, on the international market for waste-water treatment there is no competition based purely on knowledge and experience where German engineers might have an important advantage. This compe-

tion is developing into one involving mainly speed and cost, i.e. in exactly the opposite direction to that which the German sewage-treatment business wished to take in overseas markets. Besides their claim to offer good material and workmanship, their complex engineering services often create significant additional costs.

### **Standardised Solution with Standardised Engineering Based on Home Experience**

The aim must therefore be to sell German quality at a reasonable price. An impossible demand? Not necessarily. On looking more closely at the international competitors, the main factors in their favour are their low labour costs and a technological level which is lower than that found in Germany. However, the solutions

they produce are no less suitable than German processes, and the international operators of treatment plant are becoming increasingly aware of this fact. This means that the prices offered by German suppliers are coming under increased pressure. In the past, the usual response to declining prices on the German market was to reduce profit margins and the cost of project management. However, a technological standard was maintained which was not suited to the pricing conditions. This may have been good for the customers who were buying better technology for less money, but it was disastrous for the suppliers. Attempts to make good lost ground with innovative solutions only succeeded in combination with additional and special offers. In many overseas markets, this solution does not work. Another factor which increased competition was the splitting of tenders into separate tasks. This meant that many specialist operations were dominated by standard services such as pipe laying or the supply and installation of standard products such as pumps, valves etc. Complex technical and innovative elements such as control systems, aeration systems etc. where specialist companies make their actual profit declined in relation to the overall volume and value of orders. In this way,

companies carrying out specific tasks (which in the past were typical sub-suppliers) are now able to execute these partial orders much more economically than general suppliers of plant and equipment. In spite of rising material costs, the prices for such equipment have been declining for years. German suppliers now have to approach international markets in new ways in order to win new business to compensate for the decline in the sewage-treatment market at home. HST HydroSystemtechnik has tackled this problem by analysing its own processes and procedures both internally and with the help of customers and consultants. Overseas project which it obtained or failed to obtain were also carefully analysed. However, the most important source of knowledge is through contact with overseas partners, who know their markets and the preferences of their customers best. As a result of these analyses, it emerged that the following factors are of particular importance in quoting for and implementing overseas projects.

Many planners resort to ready-made solutions by technical suppliers because they do not possess sufficient specialised know-how for their own planning services. In many cases, the time taken to process quotations is relatively short. It should be

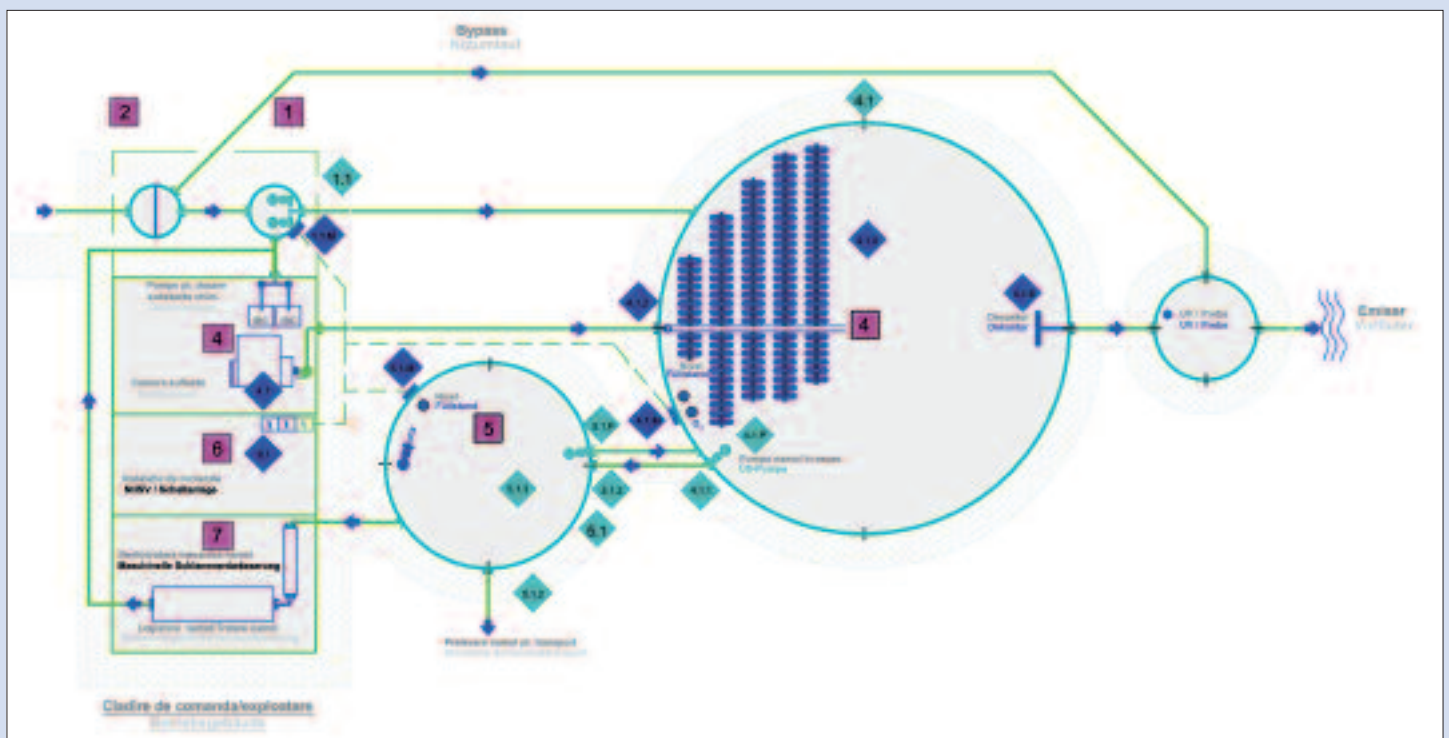
possible to implement planned and quoted solutions without any further planning or modification services. Local construction companies are often engaged as main contractors. These expect to receive all the specifications for implementation (e.g. design of foundations, tanks etc.) from the supplier of the technical equipment.

In many countries (especially in Eastern Europe) the expensive individual engineering of every single project is a considerable disadvantage. At the same time, customers still have special requirements. As a general rule, the reduction of costs generally means standardisation – but standardisation which is as flexible as possible. In developing a standardised "construction kit" for HST-SBR treatment plants, HST has succeeded in achieving a high degree of flexibility at reduced cost. Based on its analysis of the market, HST is convinced that this is the way ahead with the best prospect of success.

#### The HST-SBR Set

There is considerable potential for cost reduction in the area of individual engineering, in reducing the variety of equipment options, in simplifying construction work and reducing the time required for construction. Similar tendencies can be obser-

Example of a Systemplan HST-SBR standard treatment plant for up to 500 EW.



ved on the housing market. The demand for pre-fabricated and system solutions is rising whereas the traditional process involving architect, local building contractor and tradesmen is on the decline. The difference in costs between an individually designed and built house and a pre-fabricated house lies in the systematic manufacture of standardised components in the latter case. As with a car, there are only a limited number of feasible options. The traditional type of home owner can choose any of the heating or sanitary products on the market, whereas the owner of a prefabricated house has only limited choice. However he pays a lower price. HST has applied this principle in the planning, construction and start-up of its HST-SBR sewage-treatment plants.

At the heart of the HST-SBR sewage-treatment plants lies the HST-SBR Set for pond-type or container-type treatment plants. It consists of an engineering package, the supply of the aeration system, clarified-water discharge, and the supply and implementation of the automation system based on the HST software package HydroDat® V8. Subsidiary work such as construction work, installation, wiring, pipe-laying and fitting work, are carried out by local companies. This means that important services are provided at local prices and allow local partners to benefit by carrying out many of the tasks themselves.

#### **Cost Advantage through Innovative Volume Linking**

Another important innovation of the HST Construction Kit is its so-called volume linking. This is a new process or construction method which involved the automatic volume linking of process containers. This allows the volume potential of several containers which are temporarily not in use to be linked with one another by means of flexible geometries and automation processes in such a way that only containers of less volume are required. An example of this principle is the volumes of the inflow buffer and SBR reactor. Because of normal cycle control, there are phases in which the containers of the inflow buffer and SBR reactor are empty or partially empty for certain periods of time. This means that substantial volume potential remain unused. The HST system of volume linking permits continuous utilisation of container volumes during the sedimentation and clarified-water stages. In theory

this innovative process could be used in any system involving storage in several containers and is not limited to sewage treatment.

The tried and tested HST-SBR Construction Kit System including the volume-linking system allows the customer greater safety of planning right from the start. Based on the DWA dimensioning specifications (A131 and M210), the HST-SBR Con-

struction Kit System complies with the high requirements governing sewage purification. The modular design of the system permits easy expansion of existing plants for special processes such as membrane activation or UV treatment. Plants with capacities greater than 15,000 EW can also be extended at no great cost. The quality of the plant continues to comply with the high standards of German technology.

With its SBR Construction Kit System, HST offers standardised economical plant technology while still fulfilling the requirements of quality. All types also include the innovative HST IT technologies.

#### **The Main Characteristics of the Construction-Kit Principle for HST-SBR sewage-treatment plants:**

- Standardised dimensioning from 500 to 15,000 EW
- Use of construction-kit principle for plants larger than 15,000 EW
- Compilation of standardised planning documents with main data on cost calculation and design
- Standardisation of container infrastructure arrangement
- Simplification of choice of technology and manufacturer
- The standard kit comprises 80 % of the engineering and design planning for all sizes available
- Individual adaptation is reduced to topographical integration of the plant, selection of container type (ground-level or subterranean), limited choice of material, degree of automation and arrangement of individual containers and building areas
- HST supplies three different degrees of completion:
  1. HST-SBR Set (consisting of clarified-water discharge, aeration, automation, process monitoring, construction documents, and services of qualified engineer for start-up).
  2. Expanded HST-SBR Set, i.e. besides the HST-SBR Set, supply of machine technology, primary purification, sludge draining, pumps, fan)
  3. Complete standard plant