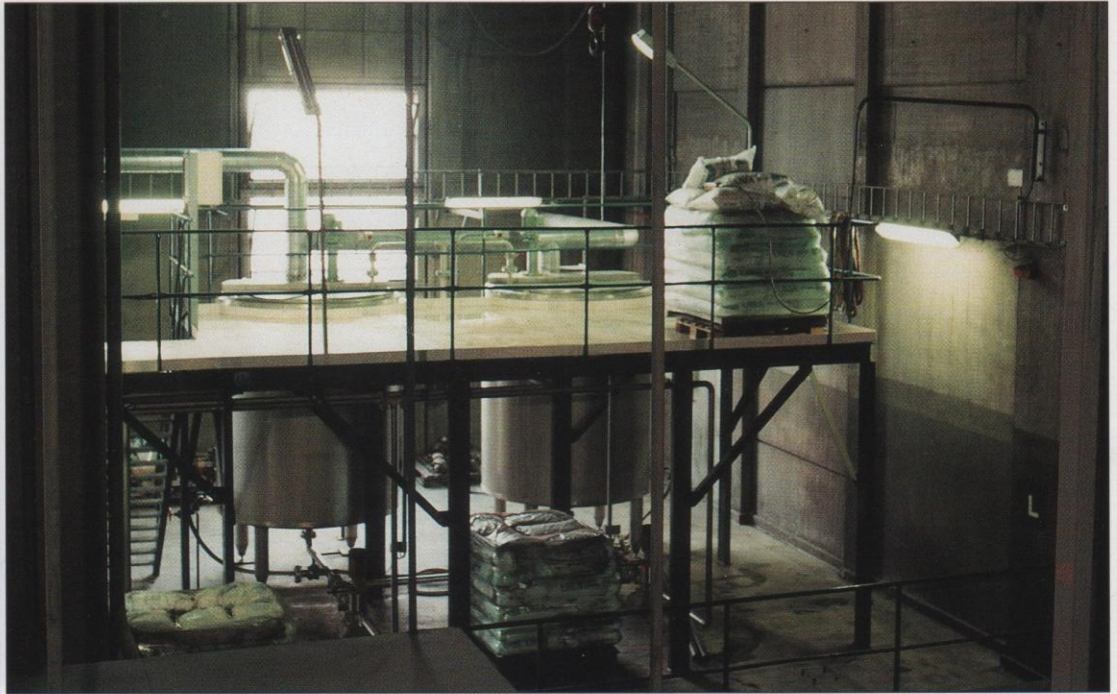


BWE SNR/SCR Systems



During the nineteen-eighties BWE has gained experience with low-cost emission control techniques for nitrogen oxides, such as Fluegas Recirculation, Over-Fire-Air and Selective Noncatalytic Reduction (injection of ammonia- or urea solutions in furnace and/or convective pass).

Through a research and development project conducted at the coal-fired danish power plant Asnæsværket (picture below), BWE has gained experience with various techniques for injecting urea solution and with a number of additives for the process. These additives were introduced to widen the temperature window of the process, and/or reduce the production of N_2O .



In the recent years BWE has cooperated with Uppsala Energi AB (Sweden) and has successfully integrated urea injection with Over-Fire-Air and even limestone injection on two peat-fired boilers. This resulted in well functioning low-cost reduction systems for NO_x and SO_x .

In 1987, an SCR demonstration plant was started up, and in the following years BWE gained valuable experience with high- and low-dust operation of the system. An interesting feature of this plant, was the installation of a catalyst in the hot end of the air preheater, with which a 90 % reduction of the injected ammonia was demonstrated.

Calculations have shown, that combining an SNR system with a small amount of SCR catalyst could often result in a NO_x -reduction comparable to that of an SCR system, at a cost of 20-40 % of a conventional SCR system.

Burmeister & Wain Energi A/S has specialized in the design, manufacture and erection of individually adapted boiler plants for firing oil, gas, coal and biomass, including the necessary process and environmental protection plants.

The range of activities includes deliveries on turnkey or part-delivery basis. Every stage of a process can be undertaken, for instance design calculations, engineering, erection and commissioning.

Further, BWE designs a wide range of auxiliary boiler equipment, such as the BWE Low- NO_x coal/oil burners.

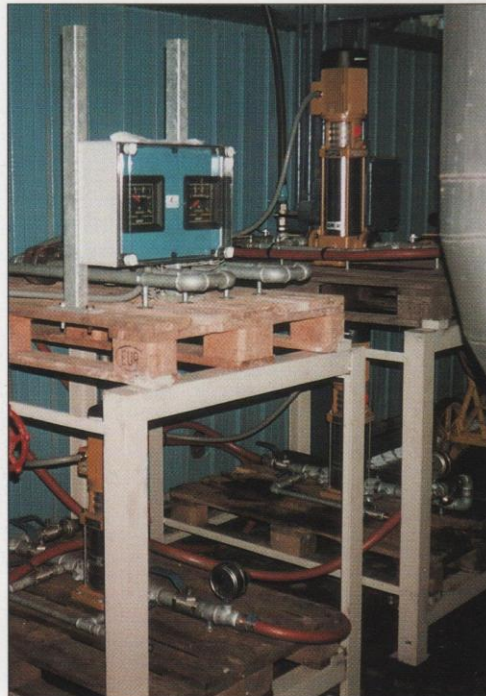
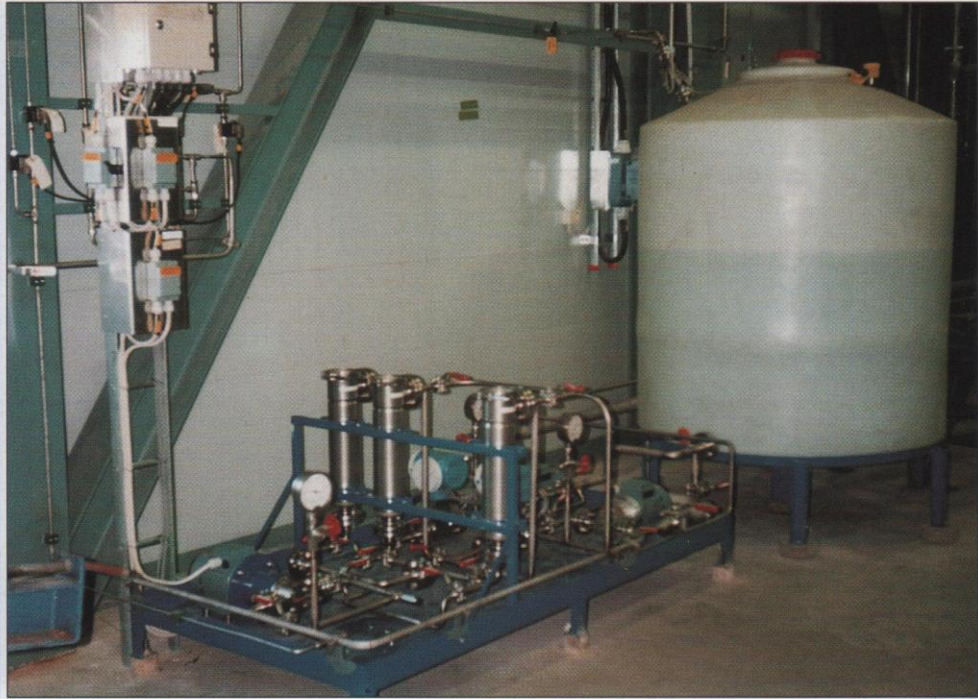
BURMEISTER & WAIN ENERGI A/S



Teknikerbyen 23 . DK-2830 Virum
Telephone +45 45 85 71 00
Telefax +45 45 85 79 33

Throughout the stage of development, BWE has cooperated with specialists in various techniques to benefit from the latest developments in i.e. computer flow modelling and kinetic modelling.

As a result, BWE has gradually gained a thorough insight into the various emission control techniques, which, together with our boiler know-how, has enabled us to tailor the equipment for various applications.



▲ Fully automatic SNR plant for ammonia solution, delivered at Ena Kraft, Enköping, Sweden. 108 t/h steam boiler, equipped with a water-cooled vibration grate, fired with wood chips.

◀ Portable test plant for urea injection, delivered at Lamarmora unit 1, ASM Brescia, Italy. 175 t/h steam boiler, fired with oil or natural gas.