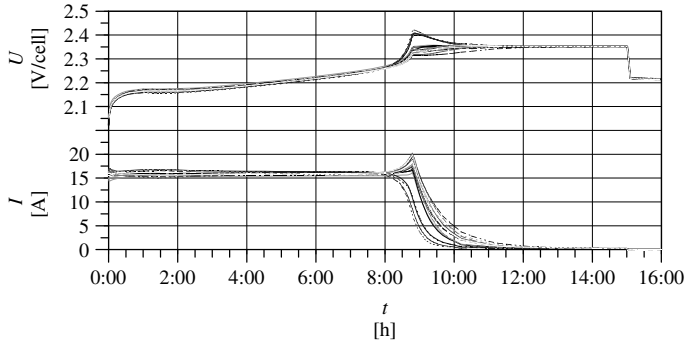

Figure 19.13 Voltages and currents of 16 series-connected cells during charging with an activated T-CHEQ

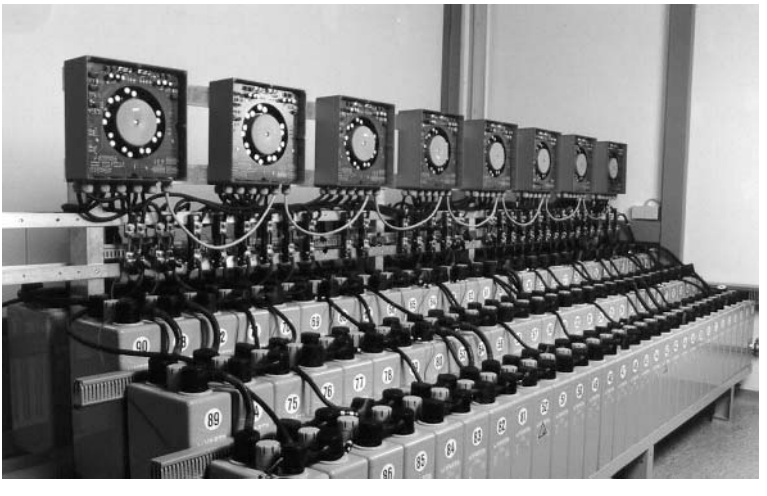

Figure 19.14 Experimental set-up with a 342-V/200-Ah sealed lead acid battery with eight cascaded T-CHEQs

charging current of 16 A and an end-of-charge voltage of 2.35 V/cell. The upper curves in Figure 19.13 show the 16 individual cell voltages and the lower curves show the corresponding cell currents. The cells with a lower capacity are the first to be fully charged – their voltage increases above the average voltage. As a result, the T-CHEQ draws some of the charging current from these cells and directs it to the cells with a lower state of charge. After 9 h, some cells are effectively charged only with 5 to 10 A, whereas the charging current for others is around 20 A. At the end of the charging phase, the T-CHEQ achieves a convergence of all the cell voltages and all the cells are fully charged.

Investigations of a 342-V/200-Ah sealed lead acid battery (VRLA, Gel-type) with eight cascaded T-CHEQs (Figure 19.14) show that such high system voltages can be operated without any difficulties. This type of battery is very sensitive to overcharging due to its demobilised electrolyte.