



Figure 11.11 Photograph of the Martin Marietta 350-kW SOLERAS system in Saudi Arabia

viability of the concentrator concept, and despite being first-generation demonstration units, had a remarkably reliable operating history [23].

Entech built four significant demonstration plants. The first was a 27-kW combined heat and electricity unit at the Dallas Fort Worth Airport and the second was a 300-kW unit on the roof of a 3M parking structure in Austin, Texas. In 1991 they installed a 20-kW test system at PVUSA, a test facility operated at that time by PG&E. This system demonstrated an overall efficiency of 11% at PVUSA Test Conditions (PTC), making it the most efficient system tested at PVUSA [24]. Similar results were obtained for a 100-kW system installed at the Central and Southwest Services (CSW) site in Fort Davis, Texas. This is shown in Figure 11.12. Another 100-kW system was installed at the TU Electric Power Park in Dallas, Texas. Entech predicted an installed price of under \$3.00/W for their systems when produced at over 20 MW/year production rate [25]. Entech continued to participate in sponsored R&D through the Concentrator Initiative (discussed below) and PVMaT.

11.3.7 The EPRI High-concentration Program

The Electric Power Research Institute (EPRI) was formed in 1974 in response to the first energy crisis. It is sponsored by a consortium of member utility companies. EPRI was conceived to fill the void in utility-related R&D that existed because utilities traditionally had very limited R&D budgets. After reviewing the field, EPRI selected high-concentration systems as the centerpiece of its PV activity. These appeared most suited for achieving the low costs needed for large PV solar farms, which was the market application envisioned at the time. (Later, the EPRI program was expanded to include amorphous silicon and ribbon silicon.) EPRI began sponsoring research on high-efficiency cells at Stanford