

#### 4.3.4 Barriers to Further Penetration

Servicing is a major deterrent to increased adoption. Service personnel are generally unfamiliar with these systems and are hesitant to maintain or overhaul them. The new system requires more maintenance, more care, and more skillful servicing than the traditional system.

Manufacturers typically train their own service personnel, but most installed systems are maintained and serviced (optimized) by in-house personnel or their subcontractors. As a result of inadequate training, the microprocessor is often improperly tuned. When a supermarket has no control over the training of its service personnel, it has a strong incentive to stick with traditional technologies or adopt equipment requiring little maintenance.

The level of engineering expertise in supermarket refrigeration is minimal. There are few "refrigeration engineers" because no university offers a degree in refrigeration engineering. Those who call themselves engineers may be engineers originally trained in other specialties. Or they may be limited in breadth of exposure to academic engineering. They are unlikely to be sophisticated in the design of refrigeration systems, even though they may have years of experience with installing or servicing them. A "refrigeration engineer" may be competent with traditional technology but unfamiliar with the principles underlying new technologies.

Another problem noted by some, but not all of the manufacturers interviewed, is the higher first cost associated with the technology. During the planning stage of a new grocery store, the A/E firm typically receives a 6% commission on its fixed, competitive bid. The bid package usually includes the cost of buying and installing refrigeration equipment, but may or may not specify a particular supplier or technology. To win the job, the A/E firms bid