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4.3 UNEQUAL PARALLEL COMPRESSOR SYSTEMS FOR SUPERMARKET REFRIGERATION

4.3.1 The Innovation

The innovation examined here is a highly energy-efficient supermarket refrigeration system. It features unequal parallel compressors, microprocessor suction pressure control, and floating head pressure control. Energy savings are achieved by employing the principle of capacity modulation. The system is better able to match compressor capacity with the required refrigeration load, and thereby can operate at the lowest possible condenser pressure. The combined effect of highest possible suction pressure and lowest possible condensing pressure substantially increases the energy efficiency ratio (EER) of the refrigeration system.

Most of the system elements of the design had been in use for some time prior to DOE's involvement and involved off-the-shelf hardware, including:

- unequal parallel compressor trains;
- floating head pressure; and
- floating suction pressure.

The use of familiar components whose reliability and service requirements were widely known was important in the eventual acceptance of this innovation.