

RAILWAY ELECTRIFICATION

9.1 Introduction

Despite the competition of airplanes, buses, trucks and cars, trains still play a major transportation role in society, filling specific markets such as high-speed and non-high-speed intercity passenger service, heavy haul of minerals and freight, urban light rail systems and commuter rail.



Figure 9-1 Overhead High Speed Railway - Courtesy of UTK, Inc.

This chapter presents an introduction to electrification of rail systems. It is intended to provide a historical perspective and an overview of typical design principles, construction practice, and maintenance considerations. Those interested in learning more are invited to review AREMA's Manual for Railway Engineering, Chapter 33, Electrical Energy Utilization, and Chapter 17, High Speed Rail Systems, which contain sections devoted to electrification power supplies, traction power systems studies and guidelines for the design of overhead contact systems.

9.2 Development of Motive Power for Railways

The earliest recorded tramway served a mine in Germany, beginning in about 1550. The tramway was developed because the rolling resistance of wheels on rails was much less

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