

2000 Elmer A. Sperry Award

Presented at the ASME 2001 Honors Assembly

To those individuals who, working at the French National Railroad (SNCF) and Alstom between 1965 and 1981, played leading roles conceiving and creating the initial TGV High Speed Rail System, which opened a new era in passenger rail transportation in France and beyond.

It was recognized early on by the Sperry Board that the development of the TGV (*Train à Grande Vitesse*) high-speed railroad system in France represents "a distinguished engineering contribution, which, through application, proved in actual service, has advanced the art of transportation" and therefore meets the criteria for the Sperry award. Although the Sperry Award has traditionally been awarded to individuals, the Board of Award determined in this instance that the sheer significance of the TGV in transportation merited recognition to all key persons involved in its conception and creation. Therefore, the award was granted to the development teams at SNCF and Alstom, the designer and manufacturer of the trains.

In the 1960s, SNCF was facing the loss of a significant portion of its passenger traffic between Paris and the southeast of France to highway and airline competition. After considerable study, experimentation, and investment, the TGV trains began operation in September, 1981 and soon recaptured the largest portion of traffic between Paris and Lyon. Within 18 months of operation, the ten millionth passenger had been carried. This was achieved by a combination of high train frequency, high operating speed, and more direct routing outside of urban areas. Travel time between Paris and Lyon went from 3 hours 50 minutes to 2 hours 40 minutes, a reduction of over 30%. The initial trains to the southeast operate at 270 km/h (168 mph) and later extensions to other parts of France operate at 300 km/h (186 mph). Within 15 years TGV trains represented over half the passenger capacity of the SNCF and are now used in several other countries.

The TGV trains were developed as an integrated system to provide fast, comfortable and cost-effective passenger trains to large numbers of people as opposed to a small number of trains commanding premium fares. Development covered the route, track, electrical power supply, trainsets, maintenance facilities, and train control systems. Starting with the initial route between Paris and Lyon, all the TGV operations have followed several fundamental principles, which include the following:

1. Use of lines dedicated solely to passenger and postal traffic, thereby permitting grades (up to 60% greater) and axle load restrictions (40% reduction) that would not have been possible on routes carrying freight traffic.
2. Avoiding the high expense of new track in urban areas and tunneling by using existing track and stations in cities.
3. The use of articulated trainsets, thereby reducing the weight, rolling resistance and power consumption compared to trains of separate cars, each supported by two trucks.
4. High-efficiency 25,000 volt, 50 Hz electrical power on new track, but trains that are equipped to operate on as many as four different voltages and/or frequencies, thereby enabling the trains to operate over a wide variety of existing trackage.