



Description of Signalling, Remote Control, Train Protection Systems, Auxiliary Systems, interlocks and their operation. Its advantages and disadvantages, in terms of its complexity, cost, maintainability and availability.

Explanation of the parts and interconnections between each other between interlocking and locking systems, Local and Remote Controls, ASFA, LZB and ERTMS systems



TRAINING PROGRAMM:

Section I. Summary & Railway Signalling Principles: Purpose of signalling systems; Basic concepts of railway operation.

Section II. Interlocking: Assembly diagram; Interlocking systems; Signalling systems associated with switches; Lineside signalling systems; Track clear detection systems; Route control table.

Section III. Block Working Principles: Block signalling methods; Decentralized automatic block systems; Centralized automatic block systems; BLocking layout.

Section IV. Signalling Control Centres: Signal box; Signalling centre; Integrated control centre.

Section V. Train Protection Systems: Signal Announcement and Automatic Braking (ASFA); LZB (linienförmige Zugbeeinflussung); European Railway Traffic Management System (ERTMS); Communications-Based Train Control (CBTC).

Section VI. Auxiliary facilities; Trenches, canalization and structural work; Signal cabin; Switch heaters; Hot axle box & wheel detection; Falling object detector; Crosswind detector; Wheel impact load detection; Dynamic behavior of pantograph.



INSTRUCTOR:

Julián Martínez Saez: Industrial Engineer by the Technical University of Madrid; Executive MBA from the School of Industrial Organization; Master New Managers of ESADE; Working experience in Solucionera (Norcontrol), Indra, Siemens (Dimetric) and Renfe / Adif; Currently, Deputy Director of Control, Command and Signalling of Adif; Collaboration with the Fundación de los Ferrocarriles Españoles on teaching face-to-face courses in Antigua (Guatemala), Caracas (Venezuela) and on-line platform courses "Railway Signalling Course"; Experience in managing on-line platforms and e-learning tutor.



ASSESSMENT Y CERTIFICATE:

This training is divided into 6 blocks containing various topics, self-assessment questionnaires and a tutored exercise final. Once the course is over, the organization will send you a certificate of achievement if you have satisfactorily completed the self-assessment questionnaire and obtained a pass grade from the instructor in the tutored exercise.