

AUTOMATIC EQUIPMENT IDENTIFICATION SYSTEMS  
FOR INTERMODAL OPERATIONS  
A RAILROAD PERSPECTIVE

By

Paul N. Kromberg

Association of American Railroads

There are two distinct aspects of intermodal terminal inventory systems:

- Terminal inventory control, which deals with the routine operation of locating equipment within the terminal and with reconciling the difference in the number of pieces of equipment that are indicated in the computer with an actual field inventory.
- Automated equipment identification (AEI), which deals with the problem of encoding each trailer which enters a terminal and when it leaves.

There are several types of AEI technologies in use:

- Temporary bar codes are temporary paper labels that are posted on a trailer when it enters through the entrance gate and are removed at the exit gate.
- Optical character recognition involves the use of a machine which reads the markings on vehicles entering and leaving the terminal, which saves time that would be spent manually marking and recording each vehicle.
- Radio frequency tags, which are temporarily or permanently affixed to the vehicle and enable the terminal operator to keep track of the vehicle at all times within the facility. Temporary tags are useful in intermodal operations where the fleet of vehicles is not captive to the railroad or the steamship company.

The Association of American Railroads and the Massachusetts Institute of Technology conducted a survey of railroads to determine what the railroad requirements are for an AEI system. Sixteen responses were received. In terms of current terminal operations practices, the survey found that few terminals have individually marked parking spaces and that virtually no terminals assign equipment to specific areas. Actual inventories of equipment in the terminals are performed from zero (0) to three times per day, and the inventories require from 0.5 to 24 man-hours to perform.

Following are a series of questions posed to the railroads about the severity of their problems in locating equipment in the terminals and their operations of AEI systems to expedite inventory control.

- Difficulty in locating equipment in yard:
  - Great - 5 railroads, Moderate - 6 railroads, Small - 3 railroads
- Could manual input to hand-held computers assist in the inventory control?

Yes - 4 railroads, Conditional - 3, No - 7

- Would radio frequency tags help in inventory control?

Yes - 1, Conditional - 4, No - 9

The railroads fear that the tags would break or get lost.

- How much a problem is it to clean labels on vehicles?

No Problem - 0, Minor Problem - 6.5, Major Problem - 7.5

- Would there be benefits to industry-wide standardization for an inventory control system?

Yes - 9, No - 5

- Is there a need for compatibility between intermodal yards and railcars?

Yes - 7, Conditional - 4, No - 4

- Is there a need for field encodability?

Yes - 7, Conditional - 1, No - 3

- Is there a need to store information temporarily?

Yes - 5, Conditional - 3, No - 3

- Where should research efforts be concentrated?

Radio Frequency systems - 4

Optical character recognition systems - 2

Both or other systems - 4

Desirable system for a small AEI system include:

- Cost effectiveness.
- Minimal maintenance and operating requirements.
- Reliability and readability are 100%.
- Ability to efficiently read/write all needed data.
- System is widely accepted by the industry and by all modes, including rail, truck, maritime.