

RAILROAD INDUSTRY JOB ANALYSIS

Locomotive Engineer

Jobs which are common throughout the railroad industry have major similarities from property to property. While minor variations do exist from railroad to railroad, and sometimes from location to location on the same railroad, the underlying personnel requirements of a specific job classification tend to remain relatively constant throughout the industry. With this fact in mind, the Railroad Personnel Association has developed this job analysis consisting of three basic parts:

- PART A - Duties and Responsibilities; this is a list of core tasks which are normally the "backbone" of the job.
- PART B - Critical Personnel Requirements; this list defines the underlying behaviors that are required of the incumbent to perform the core tasks.
- PART C - Job Setting Characteristics; this part describes the conditions under which most incumbents perform the job.

Job information was supplied by a Task Force (PART D) made up of (1) job incumbents and (2) supervisors or others intimately familiar with the job; they were drawn from several different railroads. Professional direction was provided by C. H. Lawshe, PhD, Licensed Industrial Psychologist, 1005 Vine Street, West Lafayette, Indiana 47906. General procedures used and technical data are included in Part E.

Prior to release for distribution to the railroad industry, the document was reviewed and approved by the Job Analysis Project Steering Committee of the Railroad Personnel Association.

GENERAL OVERVIEW

Job Summary. Operates electric, diesel-electric, or gas-turbine-electric locomotives, interpreting train orders, train signals, and railroad rules and regulations to transport freight or passengers in a safe and satisfactory manner.

Dictionary of Occupational Titles. The DOT lists one related job: 910.363-014 Locomotive Engineer.

Special Note. The Task Force considered freight and passenger road service, yard service, and suburban/commuter service and concluded that a single job analysis would suffice. While there is no standard training pattern throughout the industry, each railroad has some kind of apprenticeship/learner program for the induction of new employees. New Locomotive Engineers receive their work assignments via the extra-board.

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This job analysis has been prepared for use in personnel administration. It is not intended to interfere with any changes that may be made from time to time in the particular content of a position or the tasks that may be assigned to a position. It is not an agreement with any union nor is it intended to change or interpret existing contract provisions, practices, or policies.

Listings of job content, duties and responsibilities, and physical demands of the work and personnel requirements of the incumbent are meant to be descriptive only. They are not for the purpose of expanding or limiting existing employee rights to work or of restricting the carriers in making assignments, supervising the work force, determining physical qualifications, or fitness and ability of individual employees.

PART A - DUTIES AND RESPONSIBILITIES

The statements in this part are work behaviors or actions performed to achieve the objectives of the job. They were identified by the Task Force and are sometimes called *tasks* or *job activities*. The Importance Degree following each statement was assigned by the Task Force and indicates its relative importance on an industry wide basis. (5 = Most Important)

1. Examines bulletin book or bulletin board prior to run for special instructions or rule modifications concerning train movement (Importance Degree: 5)
2. Synchronizes watch with standard clock (or dispatcher) and with conductor to insure departure time from terminal and/or station is in accordance with time schedule (Importance Degree: 3)
3. Inspects locomotive before run to verify quantity of fuel, sand, water, flagging equipment, and other supplies, as required by federal and company rules (Importance Degree: 3)
4. Inspects locomotive for operational readiness by making checks and tests as required by federal and company rules (Importance Degree: 4)
5. Performs pre-run (initial or terminal) and other air brake tests as required by federal power brake law and company rules (Importance Degree: 5)
6. Receives train consist giving physical make-up of train including weights, lengths, location of loads and empties, and cars requiring special handling (Importance Degree: 3)
7. Receives starting signal from appropriate person and moves controls such as throttle and air brakes to operate locomotive (Importance Degree: 5)
8. Complies with train orders, train signals, and railroad rules and regulations to operate locomotive in an efficient manner following safety regulations and time schedule (Importance Degree: 5)
9. Applies knowledge of territory, including terrain, grades, curves, and grade crossings, in order to give prescribed warning signals and to otherwise operate train in a safe and satisfactory manner (Importance Degree: 5)
10. Communicates train signals to co-worker(s) for verification of meaning to avoid errors in interpretation (Importance Degree: 5)

11. Verifies accuracy of speed indicator at first opportunity during each run and at other times as required (Importance Degree: 3)
12. Confers with conductor or traffic control personnel by radio to give or receive information and to give instructions concerning stops, delays, or oncoming trains (Importance Degree: 4)
13. Observes track to detect obstructions and to anticipate operating problems as required by federal or company rules (Importance Degree: 5)
14. Remains constantly alert and maintains a state of readiness in order to respond appropriately to unusual conditions or circumstances (Importance Degree: 5)
15. Diagnoses minor malfunctions and performs minor maintenance and servicing activities when maintenance personnel are not available (Importance Degree: 3)
16. Inspects locomotive during or after run to detect damaged or defective equipment, prepares engine work report, and advises designated personnel as specified by federal or company rules (Importance Degree: 4)
17. Notifies proper authorities and prepares reports to explain accidents, unscheduled stops, or delays (Importance Degree: 4)
18. May perform "hostler" function by operating locomotive between various shop locations, service tracks, and switching areas (Importance Degree: 2)
19. May pilot or supervise operation of trains or diesel-electric rail-detector cars when crew is unfamiliar with territory (Importance Degree: 3)

PART B - CRITICAL PERSONNEL REQUIREMENTS

Each numbered and underlined item in this part is a generic category of behavior (a) which can be observed and/or reported, (b) which is common to a variety of jobs, and (c) which was judged by the Task Force to be critical for performing this job in a safe and satisfactory manner. It is sometimes called a *performance domain*.

Listed under each general category is one or more specific job elements identified by the Task Force (a) as commonly occurring and (b) as representative of the category. Collectively, those under a particular category constitute an operational definition of that category and delineate a personnel requirement of the job.

1. Understanding Printed/Written Information

- Reads rule books including operating rules, safety rules, timetable, and air brake rules
- Reads train orders which authorize train movements or provide for restrictions not covered by timetable
- Reads special instructions and posted bulletins
- Reads equipment manufacturer's manual and a variety of training manuals

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No's. 1, 6, 8, & 17

2. Recognizing Colors

- Distinguishes colors displayed by signals, informational signs, and apparatus, such as: lights, flags, reflectorized devices, and colored placards

NOTE: Confusion of colors can have serious consequences including loss of life and damage to millions of dollars worth of equipment/cargo.

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No. 2

3. Making Logical Choices and/or Drawing Logical Conclusions

NOTE: The process of train handling requires the mental integration of numerous classes of information which leads to the making of choices among possible actions and drawing logical conclusions. Information utilized includes: knowledge of train consist, knowledge of locomotive characteristics and capabilities, and knowledge of territory characteristics

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No's. 6, 8, 9, & 14

4. Judging Speed/Distances of Objects/Moving Parts

- Judges speed of moving train particularly if speed indicator malfunctions
- Judges appropriate time to initiate brake or acceleration operations giving consideration to locomotive and train characteristics and to terrain and weather conditions
- Judges distances and speeds of vehicles approaching grade crossings
- Constantly judges location of caboose while in route

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No. 9

5. Taking Actions and/or Making Decisions Affecting Security/Well Being or Others

- Takes appropriate action when crew members or other personnel are engaged in unsafe practices or rule violations including: stopping the train movement, advising a co-worker of improper activity, and reporting to appropriate individuals when warranted
- Takes appropriate actions when impending accidents or other emergency conditions exist
- Reports unsafe conditions that threaten the welfare and safety of personnel

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No's. 13 & 14

6. Recalling Information Required for Work Activity

- Recalls geographical characteristics of territory
- Recalls location of trackside signals in order to be alert during periods of poor visibility and as otherwise needed
- Recalls basic information and data provided in rule-books, timetables, and special instructions
- Recalls running time between stations, taking into consideration train characteristics and power available

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No's. 9 & 15

7. Understanding Oral Communications

- Receives oral instructions or information from dispatcher, yardmaster, conductor, and other railroad personnel
- Receives radio information and/or instructions
- Receives oral explanation of rules and regulations from supervisor, training officer, co-workers, and others
- Receives advisory and other information, orally, from other members of train crew

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No's. 7, 8, 10, 14, & 17.

8. Understanding Visual Displays

- Understands wayside signals, including light signals and position signals
- Understands hand or lantern signals given by crew members and other personnel
- Understands signals and indicators in the locomotive cab including: air brake gages, load indicators, and speed indicators

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No's. 8, 9, & 14

9. Exercising Eye/Hand Coordination

NOTE: Train handling constantly involves the rapid coordination of visual information regarding terrain, track and weather conditions, signals, and unexpected factors with the physical operation of train controls

This performance domain is a component of each of the following "Duties and Responsibilities" listed in PART A: No's. 7, 9, & 13

PART C - JOB SETTING CHARACTERISTICS

Each item in this part is a *job setting characteristic*. It is a structural, physical, or psychological condition (normally extrinsic to the work behavior itself) which impinges on the comfort, safety, or well being of the job incumbent. Included are any conditions which elicit from the incumbent affective reactions which influence productivity/job performance or which otherwise have significant impact. The Task Force identified these as normally being characteristic of the job.

1. Job schedule characteristics

- Schedule includes both day and night hours
- Schedule has irregular hours with possibility of extended hours/overtime
- Schedule includes some Saturdays, Sundays, and holidays
- Variable hours per week result in variable income level with no set minimum **
- Meal times vary from day to day

2. Physical environment characteristics

- Work is frequently performed out-of-doors involving exposure to weather conditions
- While some cab temperatures are controlled, much work activity is performed with cab windows open
- At times, job incumbent is not only exposed to normal summer temperatures but performs work in the cab in the presence of heat generated by the locomotive*
- Work is performed in the presence of noise generated by diesel engines, air brake equipment, sanders, horns, and radios*

3. Job characteristics with safety implications

- Work involves potential collision with other trains and locomotives, highway trucks including vehicles carrying flammable material, cars, and track obstructions including: slides, washouts, and obstructions placed by vandals*
- Work exposes the incumbent to objects thrown or dropped into the cab*
- Work exposes the incumbent to possible derailments resulting from switch tampering, broken rails, and other conditions*
- Walking to and from the locomotive exposes the incumbent to hazards associated with moving trains and other moving equipment*
- Changing electrical fuses exposes the incumbent to possible shock from burns from 600 volts*

4. Other job setting characteristics

- Work requires extended time away from home***
- Work may require frequent revisions of assignments, sometimes seemingly contradictory, due to changing priorities
- Work may require performance of duties in unfamiliar locations, particularly for newer employees who are still on the extra-board
- Work may need to be performed when incumbent is fatigued because of extra long or continuous hours
- Work may involve periods of great emotional pressure
- Work may require protective clothing and/or devices in accordance with rules on individual properties

*Items designated in this manner were identified by an earlier Task Force. Findings are presented in Consulting Report No. 65 by C. H. Lawshe, Ph.D., dated November 15, 1978, and available from the Association of American Railroads.

**Variable hours per week result in variable income.

***Work MAY require extended time away from home on the Long Island Rail Road.