Railroad Dispatcher Communications Training Materials

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13. ABSTRACT (Maximum 200 words)
Readback/hearback errors by railroad dispatchers and train crews or other track users can potentially result in accidents and derailments. The training materials developed under this project are designed to improve dispatcher communication skills with the goal of reducing the occurrence of readback/hearback errors. The course is based on a similar one developed and offered to air traffic controllers by the Federal Aviation Administration. The basic structure of the FAA course was adapted to be applicable to railroad dispatchers. The course has nine topics including Barriers to Communication, Listening Skills and Memory Skills. The course materials include a course pretest to assess initial skills, a formative assessment to assess progress after the first day of training and a summative test to evaluate trainee skills at the conclusion of the training. The training is designed to be taught over a 2-day period. This volume contains the instructor's guide and all written training materials. An accompanying videotape contains the complementary auditory exercises.

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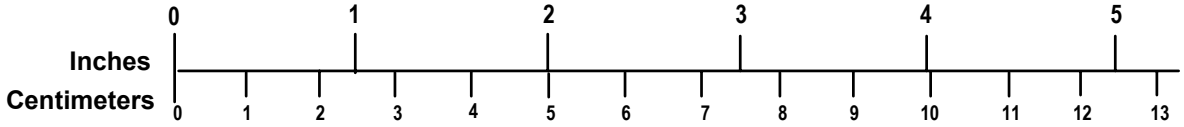
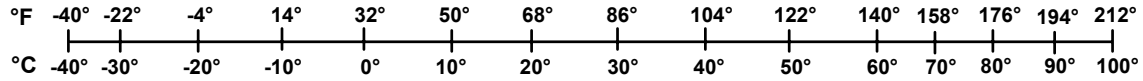
METRIC/ENGLISH CONVERSION FACTORS

ENGLISH TO METRIC	METRIC TO ENGLISH
LENGTH (APPROXIMATE)	**LENGTH (APPROXIMATE)**
1 inch (in) = 2.5 centimeters (cm)	1 millimeter (mm) = 0.04 inch (in)
1 foot (ft) = 30 centimeters (cm)	1 centimeter (cm) = 0.4 inch (in)
1 yard (yd) = 0.9 meter (m)	1 meter (m) = 3.3 feet (ft)
1 mile (mi) = 1.6 kilometers (km)	1 meter (m) = 1.1 yards (yd)
	1 kilometer (km) = 0.6 mile (mi)
AREA (APPROXIMATE)	**AREA (APPROXIMATE)**
1 square inch (sq in, in^2) = 6.5 square centimeters (cm^2)	1 square centimeter (cm^2) = 0.16 square inch (sq in, in^2)
1 square foot (sq ft, ft^2) = 0.09 square meter (m^2)	1 square meter (m^2) = 1.2 square yards (sq yd, yd^2)
1 square yard (sq yd, yd^2) = 0.8 square meter (m^2)	1 square kilometer (km^2) = 0.4 square mile (sq mi, mi^2)
1 square mile (sq mi, mi^2) = 2.6 square kilometers (km^2)	10,000 square meters (m^2) = 1 hectare (ha) = 2.5 acres
1 acre = 0.4 hectare (he) = 4,000 square meters (m^2)	
MASS - WEIGHT (APPROXIMATE)	**MASS - WEIGHT (APPROXIMATE)**
1 ounce (oz) = 28 grams (gm)	1 gram (gm) = 0.036 ounce (oz)
1 pound (lb) = 0.45 kilogram (kg)	1 kilogram (kg) = 2.2 pounds (lb)
1 short ton = 2,000 pounds (lb) = 0.9 tonne (t)	1 tonne (t) = 1,000 kilograms (kg)
	= 1.1 short tons
VOLUME (APPROXIMATE)	**VOLUME (APPROXIMATE)**
1 teaspoon (tsp) = 5 milliliters (ml)	1 milliliter (ml) = 0.03 fluid ounce (fl oz)
1 tablespoon (tbsp) = 15 milliliters (ml)	1 liter (l) = 2.1 pints (pt)
1 fluid ounce (fl oz) = 30 milliliters (ml)	1 liter (l) = 1.06 quarts (qt)
1 cup (c) = 0.24 liter (l)	1 liter (l) = 0.26 gallon (gal)
1 pint (pt) = 0.47 liter (l)	
1 quart (qt) = 0.96 liter (l)	
1 gallon (gal) = 3.8 liters (l)	
1 cubic foot (cu ft, ft^3) = 0.03 cubic meter (m^3)	1 cubic meter (m^3) = 36 cubic feet (cu ft, ft^3)
1 cubic yard (cu yd, yd^3) = 0.76 cubic meter (m^3)	1 cubic meter (m^3) = 1.3 cubic yards (cu yd, yd^3)
TEMPERATURE (EXACT)	**TEMPERATURE (EXACT)**
[(x-32)(5/9)] °F = y °C	[(9/5) y + 32] °C = x °F

QUICK INCH - CENTIMETER LENGTH CONVERSION



QUICK FAHRENHEIT - CELSIUS TEMPERATURE CONVERSION



For more exact and or other conversion factors, see NIST Miscellaneous Publication 286, Units of Weights and Measures. Price $2.50 SD Catalog No. C13 10286

Updated 6/17/98

Contents

Acknowledgments

This document contains the training materials for a course on communication skills for railroad dispatchers. The primary focus of the two-day course is on readback/hearback errors. Foster-Miller developed the course based on a similar course, "ATC Communications," designed by the Federal Aviation Administration for air traffic controllers. An accompanying videotape contains the auditory exercises for the course. This work was done for the Federal Railroad Administration, Office of Research and Development under contract DTFR53-01-D-00049 with guidance from Dr. Thomas Raslear, FRA.

A number of individuals contributed to the development of these training materials. Ms. Susan Madigan, Transit Safety Management, developed the scripts that are a key element of this training program. Dr. George Kuehn, a consultant to Foster-Miller, was responsible for the course pretest, the formative assessment, the summative test and the course evaluation form. Dr. Stephen Popkin and Ms. Sally Pham, formerly at Foster-Miller, and Dr. William Stankard, a consultant to Foster-Miller, worked on an earlier version of these training materials. Mr. Jay Parker, Mr. Mark Bennett and Mr. Peter Garrigan, are railroad dispatchers who recorded the scripts for the various course exercises. The Union Pacific Railroad, The Burlington Northern Santa Fe, CSX Transportation and the Norfolk Southern all provided video footage of trains that is a part of the course videotape.

The authors offer special thanks to Mr. John Reininger and Ms. Patricia Doll, Union Pacific Railroad. Mr. Reininger arranged a pilot offering of this course with dispatchers from several different railroads. The feedback from this activity led to substantial improvements in the training materials. Following the pilot course offering, Ms. Doll tested the revised memory exercises with a group of UP dispatcher trainees.

Background

By law, the Federal Railroad Administration (FRA) has the responsibility of ensuring railroad safety throughout the country. The U.S. rail system includes almost 300,000 miles of track, 20,000 locomotives, 1.2 million freight cars, 6,500 passenger cars, and over 250,000 employees. In an effort to improve safety standards industry-wide, the FRA has adopted a zero-tolerance policy for accidents, injuries, or deaths on the nation's rails.

Although highway-rail grade crossings and poor track roadbed are implicated in the vast majority of accidents that result in fatalities, the National Transportation Safety Board (NTSB) has determined that dispatcher error has been the probable cause of a number of accidents. Dispatchers are responsible for the safe and timely movement of track occupants through a specified territory. Because 85 percent of the U.S. rail system is "dark territory" (unsignalized track), clear and precise communication between dispatcher and track occupant is essential. Dispatchers are also responsible for the safety of railroad employees working on the track, the management of train crews, and equipment utilization.

In view of the dispatcher's safety-critical duties, the NTSB has encouraged the FRA to develop and establish dispatcher selection standards, dispatcher training standards, and dispatcher workload limits. One small but crucial part of the FRA's focus is on dispatcher communications training, specifically, the importance of issuing and confirming authorizations for track occupants to move from one point to another.

Readback/hearback refers to the process of issuing and confirming track authorizations and is central to the training you will be participating in. Consider the following model:

Dispatcher: Issues authorization.
Track Occupant: Acknowledges, and repeats authorization content **(readback)**.
Dispatcher: Acknowledges, or, if necessary, corrects track occupant's readback **(hearback)**.

Readback error occurs when the track occupant repeats authorization content incorrectly.
Hearback error occurs when the dispatcher confirms a track occupant's incorrect readback.
Readback/hearback error is the general term we will use to refer to a communication error between dispatcher and track occupant.

Each of the topics covered during training is directly related to improving dispatcher communication by minimizing or eliminating readback/hearback errors.

Purposes of the Dispatcher Communications Training

The purposes of this training are to help participants:

- Recognize the importance of communication in the railroad dispatching environment.
- Assess their own communication, listening, and memory skills.
- Identify strategies for improving their own communication, listening, and memory skills.

This training package was developed to provide you with flexibility in the development of a training session related to railroad dispatcher communications. Each topic is self-contained, allowing you to select the topic(s) relevant to the needs of your facility. However, the topics are organized in a recommended sequence. Each topic may be used as a separate training session, or as a part of a session comprising more than one topic.

The topics contained in the training package may be used for initial proficiency training and for refresher training in specific areas. The training sessions require a minimum of two participants and an instructor. If there are several participants enrolled in training sessions, they should be divided into a number of smaller groups. The optimal size for a small group is four participants. The maximum number of participants per session should not exceed 16 (four groups with four participants each).

Target Populations

This training package is designed for educating dispatcher trainees as well as experienced dispatchers wanting skill-reinforcement.

Training Methods

This training uses an active, participative approach to training. The focus in this training is on group process. Participants, assisted by the instructor, take part in a variety of activities to accomplish specified goals and tasks. The instructor's role is to help the participants accomplish the training goals established for each topic.

Answers are not provided for several open-ended questions within this package. The instructor should accept any reasonable responses from the group, as there may be several correct responses.

The training methods used in this training program include:

- Analysis and discussion of case studies.
- Audiotape-based and video-based exercises.
- Group discussion.
- Other interactive learning activities.
- Assessment instruments in the form of a pretest, formative assessment, summative test and course evaluation form.

There are no lectures. Learning will occur only if all individuals are actively involved in the training.

Training Content

The following table provides a brief description of the Railroad Dispatcher Communications Training Materials.

Topic #	Title	Description	Time
1	The Importance of Railroad Dispatcher Communications	Reviews the importance of dispatcher communications.	1 hr.
	Course Pretest	Provides instructor with indication of group skill level & predictor of progress	10 min.
2	Barriers to Communication	Illustrates factors that can limit the effectiveness of controller communications.	1½ hr.
3	Listening Skills	Identifies factors that affect listening effectiveness.	1 hr.
4	Memory Skills	Introduces or reviews memory skills.	1 hr
5	Railroad Phraseology	Develop understanding of railroad terms that have similar or identical meaning.	½ hr
	Formative Test	Informal quiz to determine progress and summarize the day	½ hr
6	Common Readback/Hearback Errors	Identifies the most common readback/hearback errors and possible ways these errors may be avoided.	1 hr
7	Identifying Readback/Hearback Errors	Provides practice in identifying readback/hearback errors.	1 ½ hr
8	Identifying Multiple Readback/Hearback Errors	Provides practice in identifying multiple readback/hearback errors.	1 hr
9	Identifying Readback/Hearback Errors – Advanced Exercises	Provides additional practice identifying multiple readback/hearback errors when distracters are present.	1 ½ hr
	Summative Test and Course Evaluation	Post-test to determine skill outcomes and participant questionnaire	20 min.

NOTE: The training times may vary greatly from one session to the next. The ***Approximate Time*** indicated for each topic is for planning purposes only. Factors that can influence the length of an activity include group size, group energy level, instructor's style, etc. You should avoid rushing through an activity if the group is engaged in active discussion. It is better to eliminate an activity than to rush the group**. Remember**…variations in time are to be expected.

Making the Dispatcher Communications Training Site-Specific

You should take into account your facility's communications-related needs and problems when planning a training session. Questions you should consider include:

- Who in your facility would benefit from this training?
- What types of communications-related needs or problems have been identified in your facility? You may wish to examine such indicators as operational error, grievances, and the general working atmosphere to help determine what areas of training to emphasize.
- How can you integrate this training with other ongoing training at your facility?

Developing Case-Study Exercises

The sample examples and case studies used in this training can be altered or replaced with site-specific examples. To develop site-specific examples or case studies, you should:

1. Develop a list of situations that will teach the same points being addressed by the examples and case studies provided in this package.

NOTE: You may want to speak to the superintendent of dispatcher operations or a chief dispatcher to obtain actual examples**.**

2. Select the situations that will best communicate the points you are trying to make.
3. Modify the situations to protect the involved parties. (If a situation is very familiar to the Center's staff, obtain permission from all the involved parties or do not use it.)
4. Have the superintendent of dispatcher operations or a chief dispatcher read the situations to make sure they include all the needed background information and clearly communicate the facts.
5. Test your discussion questions. Have several individuals read the situations and see if they can answer the discussion questions.

Preparation

Preparation involves getting ready to instruct this training program. Some general preparation suggestions are presented below.

✓ **Thoroughly review the training materials.**

Look for ways to tailor the activities to your local group. For example, you may wish to write in additional questions to ask, local events to cite, or problem situations to suggest.

Topic #	Description	Counter #
1	• Communication between two dispatchers (audio and video)	Segment #1_____
	• Course Pretest	Segment #1_____
2	• Communication between an irritable dispatcher and occupants in his territory (audio only) • Communication between a dispatcher using slang and occupants in his territory (audio only) • Communication between a dispatcher who speaks quietly and occupants in his territory (audio only) • Communication between an unsure dispatcher and occupants in his territory (audio only) • Communication between a dispatcher who speaks rapidly and occupants in his territory (audio only) • Communication between a repetitive dispatcher and occupants in his territory (audio only) • Communication between a dispatcher who speaks rapidly and presents too much information in a single transmission and occupants in his territory (audio only)	Segment #1_____ Segment #2_____ Segment #3_____ Segment #4_____ Segment #5_____ Segment #6_____ Segment #7_____
3	• Narrative with distracting noises (audio only) • Narrative with fast speaker (audio only) • Narrative with two speakers (audio only) • Narrative with monotone speaker (audio only)	Segment #1_____ Segment #2_____ Segment #3_____ Segment #4_____
4	• Memory Exercise (listening only) • Memory Exercise (repetition) • Memory Exercise (tactile) • Memory Exercise (summative)	Segment #1_____ Segment #2_____ Segment #3_____ Segment #4_____
7	• Dispatcher communications (audio only) • Dispatcher communications (audio only)	Segment #1_____ Segment #2_____
8	• Dispatcher communications (audio only)	Segment #1_____
9	• Dispatcher communications with locomotive footage (audio and video) • Dispatcher communications with wildlife footage (audio and video) • Dispatcher communications with bingo numbers (audio and video)	Segment #1_____ Segment #2_____ Segment #3_____
	• Summative Test	

✓ **Preview the Railroad Dispatcher Communications video prior to the training.**

Write down the counter numbers/times for each topic and segment in the table on the previous page. Doing so will help you easily find the segments when you are ready for them. Be sure the videotape is rewound and the counter is set to zero before cueing a topic.

✓ **Prepare the Training Room.**

Arrange tables in a configuration that allows for group interaction.

- A semicircle (u-shape) setup that permits use of a flipchart at the open end is good for large-group brainstorming.
- Round tables are good for small-group brainstorming and writing.
- Allow time for room preparation **before** the training begins.

✓ **Obtain equipment and supplies.**

- Check locations of electrical outlets to ensure that the VCR can be set up in a good location. Get extension cords if necessary.
- Have copies made of handouts and other training materials.

Opening the Training

Plan an activity to open the training. The purpose of this activity is to get acquainted, "loosen up" the group, and get ready for the activities to follow. A light approach helps set a relaxed tone. You may wish to include the following in your opening to the training:

- Introductions (yourself, participants, and any observers).
- Overview of the purposes of the training.
- Session schedule, including breaks.
- Explanation of your role.
- Discussion of participants' roles.

Conducting the Training

The following are tips for carrying out the role of facilitator.

General Suggestions

☞ **Do <u>not</u> read or lecture to the group.**

This package is a guide, not your script. Flexibility is the key to success.

☞ **Make yourself part of the group.**

Do not separate yourself physically from the group by standing behind a podium, an overhead projector, or a table.

☞ **Remember that you are working with adults.**

Involve the participants in planning, decision making, and problem solving. Value the resources they bring to the group. Encourage them to share their experience, knowledge, and ideas.

☞ **Observe how the group works together.**

- Who participates the most and who participates the least?
- Do certain participants try to dominate? Does anyone withdraw?

☞ **Do not go too long without a break.**

As a general rule, groups need a break every hour for about 10 minutes. You will need to adjust the timing of breaks to what is going on in the group.

☞ **Use each group you facilitate as a resource for the next group.**

Consider and incorporate the information contained in the ***Course Evaluation Form*** from prior training sessions. Do not be afraid to revise the topic or your approach.

☞ **Open each topic by presenting the purpose and goals for the unit.**

☞ **Close each topic by recapping the skills or lessons learned.**

Leading Discussions

- Ask open-ended questions that draw out the key points from the group. Avoid using yes/no questions.

- Encourage participation from all members of the group, but do not force responses by putting someone on the spot.

- Give positive feedback in the form of verbal praise (e.g. "good suggestion!"). This will encourage further participation from all group members.

- Do not allow one or two participants to dominate the group. If this occurs, you should inform the group that you would like to hear what everyone has to say about the topic of discussion. You can also simply ask: "Anyone else?"

- Show that you are paying attention to what each participant says. Be sure your body language (posture, eye contact, facial expression) and your response indicate that you are listening. It may be useful at times to summarize key points covered by participants.

Using a Flipchart

- Position the flipchart so that everyone can see it.
- Stand to the side while listening to the next speaker. Do not talk with your back to the group, facing the flipchart!
- When recording responses on the flipchart, record all responses.
- Make it easy to read.
- Use as few words as possible, but get approval from participant before changing wording.
- Write in large letters, at least 1½ inches high. Leave about 2 inches between lines.
- Use different colors for responses to aid legibility.
- Highlight key words with circles, boxes, arrows, or underlining.
- Limit the amount you put on one sheet.

Course Evaluation

A student course evaluation is provided in "Summative Test and Course Evaluation". Recommendations for the use of this form in conjunction with the course assessment instruments is provided in a later section.

Topic 1: The Importance of Railroad Dispatcher Communications

Note to Instructor

- Segment #1 contains communication between a dispatcher and a track occupant in which a readback/hearback error occurred. The error resulted in head-on collision, derailment, three fatalities, and five injuries. This unfortunate incident underscores the importance of ***readback/hearback*** in railroad dispatcher communication.

Purpose

The purpose of this topic is to motivate the group and to introduce the importance of clarity and precision in dispatcher communication.

Goal

- To recognize the importance of clear and precise communication.

Approximate Time

1 hour

Materials

✓ Flipchart
✓ Railroad Dispatcher Communications videotape, cued to "Topic 1"
✓ Videotape player and monitor
✓ Handout: One copy of the Definitions and Terminology Handout for each participant
✓ Handout: One copy of the Track Warrant Handout for each participant

Instructions

1. Review the definitions of readback and hearback referring to the Handout on Definitions and Terminology.

2. Railroad Dispatcher Communications videotape Segment #1: Have participants listen to Segment #1 of the videotape. A description of the incident and a transcript of the videotape segment is included on the following pages for your reference, but should not be distributed to the group. Provide the participants with the Handout of the track warrant information.

Topic 1: The Importance of Railroad Dispatcher Communications

Description of Incident

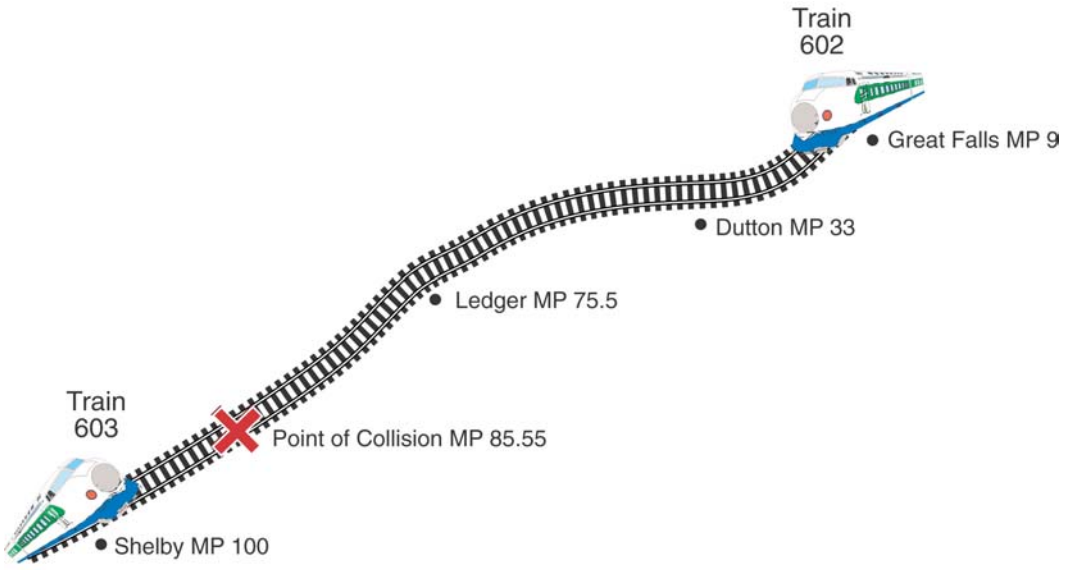
Two trains were routed over unsignaled single track territory between Shelby and Great Falls, MT. Train 602 traveled eastbound and train 603 traveled westbound. A branch line dispatcher in Seattle, WA controlled the train movements through track warrant control (TWC) using a computerized TWC system that was designed to prevent conflicting track occupancy.

At 2:55 p.m. the first shift branch dispatcher transmitted TW8851 by voice radio to the train 603 conductor at Dutton, MT, authorizing train 603 to proceed to Ledger. The dispatcher created TW8851 to 603 at Dutton, checking Line 2, to proceed from Dutton to Ledger on the main track. She also checked Line 7, not in effect until after arrival of 7825 East at Dutton.

The conductor of 603 repeated the TW to the dispatcher, repeating Line 2 as "Dutton to West yard limits Shelby." The first shift dispatcher OK'd the TW as repeated by the conductor, although the computerized TW showed the "to" destination as Ledger. At about 3:45 p.m. the second shift branch-line dispatcher relieved the first shift dispatcher. At 5:08 p.m. the second shift dispatcher issued TW8660 to train 602 by telephone to the conductor, giving authority from Shelby to Ledger.

At 5:50 p.m. trains 602 and 603 collided head-on just north of Ledger, MT on single track killing the engineer of train 602 and two brakemen on train 603. The conductor on 602 and dtwo brakemen and the conductor on 603 were injured in the crash. The resulting damage was estimated at $6.9 million.

Diagram of opposing trains 603 and 602, and point of collision



Segment #1:

This segment contains communication between a dispatcher and one track occupant regarding Track Warrant # 8851 (track warrant contained in Handout):

Method of Commu-nication	Person Speaking	Transcription
Radio	Dispr	Seattle branch dispatcher answering
Radio	Train 603	Dispatcher, this is 603. We'd like to get a warrant to get out of Dutton.
Radio	Dispr	Okay, let's make it TW 8851, eight-eight-five-one, to 6905, six-nine-naught-five, West, w-e-s-t. You're at Dutton now?
Radio	Train 603	Roger, we've stopped at the east end of Dutton, or the west end of Dutton, I mean.
Radio	Dispr	Dutton, Dutton, D-o-t-t-o-n *(sic*). Item 2, t-w-o, Proceed from Dutton, D-o-t-t-o-n, D-u-t-t-o-n, to (nine second pause) Ledger, L-e-d-g-e-r, on main, m-a-i-n, track. Item 7, s-e-v-e-n, Not in effect until after arrival of 7825, seven-eight-two-five, East, e-a-s-t, at Dutton, D-u-t-t-o-n. Item 8, e-i-g-h-t, Hold main track last named point. Item 15, one-five, Protection as prescribed by Rule 99 not required against following trains on same track, and ok to repeat.

Method of Commu-nication	Person Speaking	Transcription
Radio	Train 603	TW number 8851, dated August 30th, 1991, to 6905, six-nine-oh-five, West, w-e-s-t, at Dutton, D-u-t-t-o-n, Item 2, t-w-o, Proceed from Dutton, D-u-t-t-o-n, to west, w-e-s-t yard limits Shelby, S-h-e-l-b-y, on main, m-a-i-n, track. Item 7, s-e-v-e-n, Not in effect until after arrival of 7825, seven-eight-two-five, East, e-a-s-t, at Dutton, D-u-t-t-o-n. Item 8, e-i-g-h-t, Hold main track at last named point. Item 15, one-five, Protection as prescribed by Rule 99, nine-nine, not required against following trains on the same track.
Radio	Dispr	8851 is ok 13, B-K, 1455, one-four-five-five, Dispatcher N-K-J.
Radio	Train 603	TW 8851, eight-eight-five-one, is ok at 1455, one-four-five-five. Dispatcher N-K-J.
Radio	Dispr	All right, thank you.

3. Ask the participants the following questions and record their responses on the flipchart:

Q. What communication problems contributed to this situation?

Q. How could the communications have been improved to avoid this situation?

Q. What strategies do you use to avoid these types of problems?

Topic 1 Handout: Definitions and Terminology

Readback/hearback refers to the process of issuing and confirming track authorizations and is central to the training you will be participating in. Consider the following model:

Dispatcher: Issues authorization.

Track Occupant: Acknowledges, and repeats authorization content **(readback)**.

Dispatcher: Acknowledges, or, if necessary, corrects track occupant's readback **(hearback)**.

Readback error occurs when the track occupant repeats authorization content incorrectly.

Hearback error occurs when the dispatcher confirms a track occupant's incorrect readback.

Readback/hearback error is the general term we will use to refer to a communication error between dispatcher and track occupant.

Topic 1 Handout: Track Warrant Form

Track Warrant Form

BN
Railroad

No: 8851 **August 30, 1991**
To: 6905 West **at Dutton**

1. **( ) Track number ___ is void.**
2. **(X) Proceed from Dutton to Ledger on Main track**
3. **( ) Proceed from _____ to _____ on _____ track**
4. **( ) Work between _____ and _____ on _____**
5. **( ) Not in effect until _____**
6. **( ) This authority expires at _____**
7. **(X) Not in effect until after arrival of 7825 East at Dutton**
8. **(X) Hold main track at last named point.**

15. **(X) Protection as prescribed by rule 99 not required against following trains on the same track**

Ok at 1455 Dispatcher NKJ

Copied by Meyers

This pre-test should be administered after the completion of Topic 1. A pre-test is a preliminary reading of the participant skills that will be assessed at the end of the course. The pretest is intended to serve two purposes. First, asking questions that assess participant competence in regard to desired course outcomes can help you avoid either wasting time covering material previously mastered or from moving too quickly based on an over-estimation of participant familiarity. The second purpose of the pretest is that it "primes" the participants for what is to come; a practice known to enhance student performance.

Materials

The materials required are the video "test" tape of sample communications, the pretest answer sheets and the pretest answer key.

Instructions

Explain that:

- A test will be given at the end of the course to determine if any changes have occurred in participant ability to identify readback/hearback errors.
- For comparison purposes, a pretest will be given now. Participants will be able to compare their individual pre and post-test scores at the end of the course. *Do not reveal to the students that the post test uses the same taped exchanges as the pretest.*
- The pretest will be checked but not graded. Individual results will be private.
- Ten taped exchanges between train crew and dispatcher will be played. Each exchange will be played only one time. Following the exchange, participants will have 30 seconds to determine if a readback/hearback error occurred and, if so, what the nature of the error was.
- Hand out the answer sheets. Note that the process is to first indicate if there was an error in the exchange and then to write a note describing the error

Cue up the tape and administer the pretest as described above. At the end of the test, collect the papers and announce a break. During the break, quickly compare the results against the key. ALL of the selections have one or more errors. Writing down the literal error is acceptable as a description. For example, it is acceptable if a participant notes "12 cars" to indicate that a readback substituted "12 cars" for "15 cars."

It is not necessary to count errors at this point. Simply review the answer sheets to get a rough sense of the error rate for the class as a whole. Low error rates (typical participant misses only 1 or 2 answers) means that the participants are likely to master the course material quickly and thus discussion periods can be allowed to ramble on a bit. Higher error rates imply that it may be necessary at times to rein in discussion to preserve sufficient time to cover all of the course material.

At the end of the day, formally check the answer sheets and save the test results for comparison against the final test. Do not discuss the results of the test and do not indicate that the same test will be repeated at the end of the course.

A pretest script and an answer key are provided below.

Pretest Script

1. Substitution ("clear" for "cut")

Dispatcher:	SP 4498 south, I want you to cut the crossing at Payne's, over.
SP 4498 South:	Okay dispatcher, we'll clear the crossing at Payne's, over.
Dispatcher:	OK, good, out.

2. Omission ("three blocks")

Dispatcher	Q2492, engine CSX 1124 with Engineer Johnson at 9:12 a.m. you are authorized to proceed through three blocks, Cooper through Exeter, over.
2492	Q2492, engine CSX 1124 with Engineer Johnson at 9:12 a.m., I am authorized to proceed through blocks Cooper through Exeter, over.
Dispatcher	Q2492, engine CSX 1124, that is correct. Out.

3. Substitution ("four-one" for "four-zero-one." This might also be considered an omission)

Dispatcher	Order number 14, one-four, to WA-1, Engine BN 401, four-one, at Pinecrest, P-I-N-E-C-R-E-S-T. Engine BN 401, four zero-one works extra 730 a.m. seven-three zero until 230 p.m., two-three-zero, on main, m-a-i-n, track between Willow Springs W-I-L-L-O-W S-P-R-I-N-G-S and Wentworth W-E-N-TWO-R-T-H not protecting against extra trains, over.
BN 401	Order number 14, one-four, to WA-1, Engine BN 401, four-zero-one, at Pinecrest, P-I-N-E-C-R-E-S-T. Engine BN 401 works extra 730 a.m. seven-three-zero until 230 p.m. on main m-a-i-n track between Willow Springs W-I-L-L-O-W-S-P-R-I-N-G-S and Wentworth W-E-N-T-W-O-R-T-H not protecting against extra trains, over.
Dispatcher	Okay that 401, complete order number 14 at 730 a.m. dispatcher MSM, over.

BN 401	Order number 14 complete at 730 a.m., dispatcher MSM, copied by Conductor Gale, over.
Dispatcher	Okay, out.

4. Transposition ("approach medium"/"medium approach")

Train 657	Train 657 to dispatcher, we just went by the signal at Arbor, number 1 track. The wayside signal showed medium approach while the cab signal indicated approach medium, over.
Dispatcher	657, ok you should be governed then by the more restrictive speed, take the approach medium, over.
Train 657	Uh, dispatcher, wouldn't the more restricting be the medium approach, over?
Dispatcher	Oh, yeah, right, take the medium approach, over.
Train 657	Okay, governed by approach medium to the next signal, out.
Dispatcher	Okay, out.

5. Omission ("restricted speed")

YPRFE-22	Dispatcher this is YPRFE-22, we had to stop here just south of CP 292 to check a sticking brake. Everything seems to be ok now, and we're back on the move, over.
Dispatcher	Okay YPRFE-22, proceed at restricted speed to the next signal, prepared to stop short of any trains, obstructions, or improperly lined switches, over.
YPRFE-22	Okay YPRFE-22 to proceed to CP 292, prepared to stop short of any trains, obstructions, or improperly lined switches, over.

6. Substitution ("limited" for "normal")

Train 431:	Train 431 to dispatcher, we have a ditch-light out on engine 1113 at Roberts, over.
Dispatcher:	Okay, 431, got a ditch light that's inoperative. Ok to proceed at normal speed, I'll see if I can get someone to take a look at them when you get back into the station. All the other engine lights operative, over?
Train 431:	Everything else is working ok, we'll proceed at limited speed til we get to the station for repairs, over.
Dispatcher:	Okay, out.

7. Omission ("run slow through high water area")

Dispatcher	Train 323, I've got a report of high water, southward track between MP 14 and MP 13. I'd like you to run slow through there and give me a report of what you find, over.
Train 323	Okay dispatcher, report of high water, southbound track between MP 14 and MP 13. We'll call you with a report of what we find, over.

8. Substitution ("on No. 1" for "on No. 2", "Station" for "Crossover")

Dispatcher	After Train 4 arrives at Parrish Crossover, Train 1 has right over opposing trains on No. 2, t-w-o, track Parrish Crossover to Edwards Crossover, over.
Train 1	After Train 4 arrives at Parrish Crossover, Train 1 has right over opposing trains on No. 1, o-n-e, track Parrish Crossover to Edwards Station, over.
Dispatcher	Okay. Complete at 1331, DFR, over.
Train 1	Complete, 1331, DFR, out.

9. Omissions ("14 loads, 5 empties", "3rd head car is a dangerous")

Dispatcher	REPY-27, engine CR 156, you need to pick up 19 cars on the Reading track – 14 loads, 5 empties, the 3rd head car is a dangerous. Also, when you make your double, I'll need you to clear the north end of the yard so I can line the through freight out first; he's on his test now, over.

REPY-27 REPY-27, engine CR 156, pick up 19 loads on the Reading track, clearing the north end of the yard for a through freight, over.

Dispatcher Thanks, out.

10. Transposition or Substitution ("1415" for "1514")

Dispatcher Train number 1435, the provisions of Bulletin Number S-31, three-one, are suspended for the remainder of this date only at 1514 Dispatcher BPO, over.

Train 1435 To train number 1435, the provisions of Bulletin Number S-31, three, one, are suspended for the remainder of this date only at 1415 Dispatcher BPO, over.

Dispatcher Okay 1435, out.

Readback/Hearback Course
Answer Sheet

Directions: Please write your name on the line provided below. Listen as the taped exchanges are played. First, check either the YES or NO box to indicate whether you think the exchange was correct or now. If the exchange was not correct, then check the type of error or errors you think were made (there may be more than one type of error).

Name:_____

Sample #	Correct?		Type of Error
	Yes	No	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Answer Key for Pretest

(Note that participant answer sheet does not have call signs or train numbers. Answer for error type need not use terms like "substitute" or "omit" as long as error is described)

Problem # and Call Sign	Correct?		Type of Error
	Yes	No	
1. SP 4498		X	Substitutes "clear" for "cut"
2. Q2492		X	Omits "three blocks"
3. BN 401		X	Substitutes 41 for 401 (or omits "0")
4. Train 657		X	Transposes "approach medium" with "medium approach"
5. YPRFE-22		X	Omits "restricted speed"
6. No. 431		X	Substitutes "limited" for "normal"
7. Train 323		X	Omits "run slow through high water"
8. Train 1		X	Substitutes "on No. 1" for "on No. 2" and "Station" for "Crossover"
9. REPY-27		X	Omits "14 loads, 5 empties" and "3rd head car is a dangerous"
10. Train 1435		X	Transposes (or substitutes) "1415" for "1514"

Note to Instructor

- During the discussion questions after each audiotaped segment, encourage participants to relate segment content to their communication with others in different settings and situations. They should recall experiences when a speaker presented more information than they could remember or when they anticipated what a speaker was going to say, without really listening.

- Asking participants how they have had to adjust to those who speak too rapidly, slowly, softly, irritably, or impatiently, will be a good lead-in to Topic 3: Listening Skills.

Purpose

The purpose of this topic is to illustrate and create discussion of factors that can limit the effectiveness of dispatcher communications.

Goals

- To become aware of the strengths and weaknesses in how dispatchers communicate.

- To identify causes of ineffective communication.

- To recognize how a dispatcher's attitude and manner of speaking can interfere with effective communication.

Approximate Time

1 ½ hours

Materials

- ✓ Flipchart
- ✓ Railroad Dispatcher Communications videotape, cued to "Topic 2"
- ✓ Videotape player and monitor
- ✓ Handout: One copy of the Communication Characteristics Handout for each participant

Instructions

1. Introduce the purpose of this topic.

2. Distribute a copy of the Communication Characteristics Handout to each participant.

3. Review the following instructions:

   As you listen to the tape, write down what you think are the strengths and weaknesses of each dispatcher's style of communication, and what impact those qualities might have on the effectiveness of communication.

4. Start the videotape, let it play through all seven segments, and then stop the tape. Transcripts of the videotape segments are included on the following pages for your reference, but should not be distributed to the group.

Segment #1:

This segment contains communication between a dispatcher, who is uptight and irritable, and track occupants in his or her territory.

Dispatcher: Extra 614 North - how many cars in your train, over?

Train Crew: 64, over.

Dispatcher: 64. Ok then, you'll pull into the passing siding to clear for the westbound, over.

Train Crew: Ok, dispatcher, I'm not sure we're going to fit to clear the main…maybe we could clear up at Davis instead, over.

Dispatcher: I'm telling you, you'll clear up on the siding - that's an order. Out.

Train Crew: Ok, dispatcher…out.

Segment #2:

This segment contains communication between a dispatcher who uses slang, and track occupants in his or her territory.

Dispatcher: Extra 1517 West, I'll bring you to Beverly for the passenger train. Right, uh, you'll go in the hole for the passenger, out.

Train Crew: Okay dispatcher, hold at Beverly for the passenger train to clear, out.

Segment #3:

This segment contains communication between a dispatcher who speaks very quietly, and track occupants in his or her territory.

Dispatcher: Extra 1542 South, you'll have to check for a hotbox, 15 from the rear of the train, over.

Train Crew: Dispatcher, say again - check 16 from the rear, over?

Dispatcher: Yes, 15 from the rear, over.

Dispatcher: Engine 204, ok to open up the switch and operate in east direction on westward track, um, eastward track between Willows and Ports, over?

Engine 204: Engine 204 ok to head east on the westward track, Willows to Ports. Permission to open up the switches, over? (train crew planning to open up two sets of switches and go from the yard crossing over from the east to the westward track, then head east.)

Dispatcher: Yes, ok to open up the switch at Willows, run east to Ports, out.

Segment #4:

This segment contains communication between a dispatcher who is tentative and unsure, and track occupants in his or her territory.

Dispatcher: Extra 324 West, proceed at reduced speed between Milepost 45 and Milepost 46,…ah no, uh, restricted speed, over (mumbled).

Train Crew: Reduced speed between 45 and 46, over.

Dispatcher: Engine 1964, you're ready to come out of the plant and go east with your train - you have time before the passenger train, right? You're going to be in the clear for them, right? I mean you're ready to go right now, over?

Engine 1964: Look, dispatcher, we're on short time here and this is a priority switch. If we don't get these cars set this morning…

Dispatcher: Ok, ok to open up the east wye switch and head east with your train, over.

Engine 1964: Okay, we're coming off the west wye, then heading east with 14 racks, over.

Dispatcher: Uh, okay, head east with your train, out.

Segment #5:

This segment contains communication between a dispatcher who is unsure of the physical characteristics of his or her territory, and track occupants in his or her territory.

Dispatcher: Extra 1032 East, run Milepost 107 to Branson. Uh, you're not going to go over the crossover switch at Branson, are you? Okay, to Branson, over.

TrainCrew: Okay, 1032 East run 107 to Branson, over.

Dispatcher: Right, stop short of the switch, will you, over?

Train Crew: Dispatcher, do you want us to run to Branson, or what? We got orders to go to Branson…over.

Dispatcher: Yeah, ok, right - run to Branson, out.

Segment #6:

This segment contains communication between a dispatcher and track occupants in his or her territory when there is a great deal of noise interference.

Dispatcher: Foreman Dawson, ok, you're working next to mainline one at Pine. Ok, I've got no extras coming. You're not fouling, right? Over.

Track Crew: Yeah, well, we may be swinging the crane clear across the track, over.

Dispatcher: Ok, as long as you say you're clear of the tracks. Out.

Segment #7:

This segment contains communication between a dispatcher who presents too much information in a single transmission, and track occupants in his or her territory.

Dispatcher: EDSP, I'd like you to make your pickup on the headpin, 22 cars on the diesel track - hold onto them, then, go back and get your Rochester's, set them off on the stub track. When you're ready to get your train together, give me a shout, I've got two westbounds to get by you, don't make your double 'til they've gone west, then, ok to open up to double the train, do your test and head west. Pick up the bills in the box at the west end of the stub track, over.

Train Crew: Okay, dispatcher, first pickup's on the diesel, set off our Rochester block on the stub track. Then ok to open up when the westbound is by, then make our test and go, over.

Dispatcher: That's correct, dispatcher to signal Foreman Brown, over.

Foreman: Dispatcher, we'd like to get some time between Pine and Willow to change out some bond wires, over.

Dispatcher: Okay Foreman Brown, if you're not actually fouling the track with men or equipment you've got about 25 minutes before MCDX-22 departs Rollstone where he's making a set-off and picking up an engine, then you've got an eastbound that was called for 1500 at Pond, he should be about on his test by now…so you've probably got at least 30 minutes there, over.

5. Ask the group the following questions about each situation. (**NOTE:** It is recommended that you replay each segment one by one, stopping between segments, during the discussion.)

Q. What barriers to communication might be caused by the dispatcher's manner of speaking or attitude?

Q. What impact might these types of barriers have on the effectiveness of communication?

Q. What might be causing the person to communicate this way?

6. Summarize by reviewing the barriers identified by the group. Ask the following questions and record key points about barriers to communication on flipchart:

Q. What are the biggest barriers to communication that you encounter on the job?

Q. What can you do to remove common barriers to communication

Topic 2 Handout: Communication Characteristics

Instructions: As you listen to the tape, write down what you think are the strengths and weaknesses of each dispatcher's style of communication, and what impact those qualities might have on the effectiveness of communication.

Dispatcher #	Communication Strengths/Weaknesses	Impact on Communication
1		
2		
3		
4		
5		
6		
7		

Note to Instructor

- Remind participants to require complete and accurate readback of authority.

- After the initial discussion of listening skills, participants will view four videotape segments. The segments present factual information that participants will be asked questions about. Each segment will contain a distracting element, requiring participants to focus their attention and listen carefully.

Purpose

The purpose of this topic is to review the listening skills used by dispatchers.

Goals

- To recognize the factors that affect listening effectiveness.

- To identify strategies for effective listening.

Approximate Time

1 hour

Materials

✓ Railroad Dispatcher Communications videotape, cued to "Topic 3".
✓ Videotape player and monitor.
✓ Handout: One copy of the Strategies for Overcoming Distractions Handout for each participant

Instructions

1. Introduce the purpose of this topic.

2. Ask the group the following questions:

Q. What differences have you noticed between how well you listen when you are working as a dispatcher and how well you listen in your outside life?

Q. What factors affect how well you listen to something or someone?

NOTE: If not mentioned by the group, you may want to suggest the following factors:

- **Speed/pacing/tone of speaker** in comparison with mental speed of listener. (For example, talking at a very slow pace may allow stray thoughts to enter the listener's mind; talking too fast may be hard to follow.)

- **Outside distractions** (noise, activity, static).

- **Internal distractions** (other thoughts or tasks).

- **Importance/relevance of information** (prioritization).

3. Now ask the group the following questions:

Q. When you really want to listen, what do you do?

Q. Why do you turn on and off the special kind of listening you do on the job?

NOTE: If not mentioned by the group, you may want to suggest the following factors:

- Focus, pay attention, clear your mind of other thoughts.

- If distracted by another task, finish the task and ask for a readback if possible. **NOTE:** Depending on the priority of the communication, it may not be possible to wait until the task is completed.

- Connect the voice to an item (track display, mental picture, notes).

- Avoid hearing what you expect to hear.

4. Listening Audio Exercises: Tell the participants you are about to play a tape containing spoken information *that is not related to railroad operations*. Ask them to listen carefully. Start the videotape, and play as many of the four segments as you wish. (Scripts of these segments are provided on the following pages for your reference, but should not be distributed to the group.) Stop the tape between segments to ask participants questions about the material presented. Sample questions, and answers to the questions, are included below each segment's script. You may also make up your own questions.

Segment #1:

This audiotape segment will include distracting noises that come and go throughout the narrative. The narrator will read the following information about the Harvest Moon:

The Harvest Moon is the full moon nearest the Autumnal Equinox, the first day of Autumn. The Harvest Moon ushers in a period of several successive days when the moon rises soon after sunset. This phenomenon gives farmers in temperate latitudes, such as North America, extra hours of light in which to harvest their crops before the first frost.

The next full moon after the Harvest Moon is called the Hunter's Moon. The Hunter's moon provides some extra hours of light, but is less marked.

Sample questions:

Q. How is the Harvest Moon related to the Autumnal Equinox?

Answer: It is the full moon nearest to the Autumnal Equinox.

Q. What is the Autumnal Equinox?

Answer: The first day of Autumn.

Q. Why did the Harvest Moon get its name?

Answer: Because the moon rises soon after sunset, it gives farmers extra hours of light in which to harvest their crops.

Segment #2:

This audiotape segment will involve a speaker who is difficult to understand due to fast speech. The narrator will quickly read the following passage:

Videocassette recorders, a technology originated in the U.S. in 1961 but today dominated by Japan, continue to change the home entertainment habits of millions of Americans. A major reason for the boom in videocassette recorders, or VCR's, has been the steady reduction in the price of portable machines, from more than $1,000 a few years ago, to as low as $250 today. There are more than 15,000 video stores, as well as hundreds of grocery, drug, and other retail stores offering tapes in the U.S. Many libraries across the nation are making videocassettes available for borrowing at no cost.

Another boon to the VCR industry was a January 1984 Supreme Court decision which establishes that Federal copyright laws are not violated by taping of a television broadcast at home for later viewing. This practice called "time shifting" in the industry, has been one of the strongest selling points for VCR's.

Sample questions:

Q. In what country did the technology for producing VCR's originate?

Answer: The United States.

Q. In what year?

Answer: 1961.

Q. What is "time shifting," and is it legal?

Answer: Time shifting is recording a television broadcast for later viewing, and it is legal.

Segment #3:

This audiotape segment will present a speaker who is reading a passage. A second voice will be heard on the audiotape. The second voice will sound like a series of thoughts that are going through the listener's mind.

Voice #1

If you're looking for the ultimate health food drink, the Chinese have just the thing: ant juice.

A delicacy in China for 3,000 years, ants contain as much protein as soybeans, according to The China Daily. Also rich in trace elements, such as zinc, ant juice is touted as a cure for all sorts of ailments.

There's just one hitch: the elixir may also add inches to the waistline. Ants, the newspaper says, have four times as many calories per unit weight as beef.

Voice #2

Gee, today's the first of the month. The rent's due. The car is acting up again, this time it's probably the engine. Where are we going to get the money for a new car engine? Sally didn't look well today. I don't think that doctor knows what he's doing. There's gotta be a better clinic to take her to. I need to call that HMO and talk to someone higher up. Oh, I almost forgot, Mom and Dad are coming to stay with us for a week. What a time for them to decide to visit. Gee, and I'm supposed to be listening to this nonsense. How am I supposed to listen when I've got all this on my mind?

Sample questions:

Q. How long has ant juice been a delicacy in China?

Answer: 3,000 years

Q. Ant juice contains as much protein as what other food source?

Answer: Soybeans.

Q. How do the calories in ants compare with those in beef?

Answer: Ants have four times as many calories per unit weight as beef.

Segment #4:

This audiotape segment will be read by a narrator who speaks in a monotone.

Using the OTR button on the VCR . . .

Using the OTR button enables you to record automatically in 30-minute timed intervals for up to 2 hours. To use the OTR function, complete the following steps:

1. *Select the channel you want to record.*
2. *Load cassette. Make sure that there is sufficient tape to be recorded.*
3. *When the OTR button is pressed, recording starts and continues for lengths of time indicated by the timer display (up to 2 hours). After pressing the OTR button, the present time display is replaced by the OTR recording time display. For example, if you press the OTR button once, the recording time displayed is 30 minutes. If you press the button twice, the recording time displayed is 1 hour. If you press the OTR button three times, the recording time displayed is 1 hour 30 minutes. If you press the OTR button four times, the recording time displayed is 2 hours. However, if you press the OTR button five times, the recording time displayed is 0. During OTR recording, the display indicates the OTR recording time remaining.*
4. *To stop recording temporarily, press the PAUSE button. To restart recording, press the PAUSE button again.*
5. *To stop recording, press the STOP button. The COUNTER/TIME display will now show the counter.*

Sample questions:

Q. List the steps involved in using the OTR button.

Answer: Select the channel, load the cassette, press the OTR button the appropriate number of times, stop the recording.

Q. What happens if you press the OTR button five times?

Answer: The recording time displayed will be zero.

Q. What does the display indicate during OTR recording?

Answer: The OTR recording time remaining.

5. Summarize by asking the group what factors affected how well they listened to what was said on the tape.

Topic 3 Handout: Strategies For Overcoming Distractions

You may find the following strategies helpful in overcoming distractions:

- Focus, pay attention, clear your mind of other thoughts.
- Eliminate as many outside distractions as possible (e.g. noise, voices, etc).
- If distracted by another task, finish the task and ask for a readback if possible. (NOTE: Depending on the priority of the communication, it may not be possible to wait until the task is completed.)
- Connect information to an item (track display, mental picture, notes).
- Listen to what is being said, not what you expect to hear.
- Group information in a logical order (Sequentially, in order of priority, etc.).
- Repeat information that you need to remember, aloud or in your head.
- Write information down as you hear it.
- Separate key points from other extraneous information, either mentally or in writing.

Note to Instructor

- Participants will view four videotape segments. Each segment requires the participant to utilize an additional memory skill. In theory, memory performance should improve as the segments progress. However, development of these skills takes time, and your group's results may not reflect the predicted trend. It is still very important to emphasize that **listen, look,** and **write it down** are **forms of rehearsal** that improve memory performance.

Purpose

The purpose of this topic is to introduce or review the memory skills used by dispatchers.

Goals

- To recognize the importance of using effective memory skills in dispatcher communications.
- To identify factors that affect memory.
- To identify strategies and techniques for effective memory.

Approximate time

1 ½ hours

Materials

✓ Flipchart.
✓ Handouts: One copy of the Memory Techniques for each participants to be handed out at the end of the Group Discussion Section and one copy each of Memory Dynamics to be given out at the end of the Topic 4.
✓ Railroad Dispatcher Communications videotape cued to "Topic 4".
✓ Videotape player and monitor.

Auditory Memory Exercise: Have participants listen to Segment #1 (described below) on the Railroad Dispatcher Communications videotape. Explain that they are NOT PERMITTED to take notes. The segment contains a reading of a request given to a dispatcher by a train engineer and is audio only. Following the request, there will be distracting information.

Segment #1

7545 west has 15 behind 5 for Centerville. We'll make a cut at the home signal and after we get across the plant we'll need the south lead. I'll call when we're ready to get back against our train. Over.

The current temperature 76°. Today's weather forecast is a 90% chance of rain this morning with thunderstorms expected around 2:30 p.m. Winds expected to reach 25 miles per hour and a low tonight of 55°.

1. After the segment is over, stop the tape and have the participants write down what they can remember the engineer saying in the first video segment. Compare what was remembered to what was said on the tape as you play the tape again.

2. Use the following questions to guide the discussion of the segment:

Q. What made remembering the engineer's request difficult?

Q. What could have been done to improve your recall of the request?

3. Auditory Repeat Memory Exercise: Have participants listen to Segment #2 (described below) on the Railroad Dispatcher Communications videotape. Explain that they are NOT PERMITTED to take notes. The segment contains a reading of a request given to a dispatcher by a train engineer with the request spoken a second time. Repetition of the request is followed by a distracting question from the chief.

   Segment #2

   ZHOT is only making 19 mph coming by MP 276. We're going to need a helper to get up the hill at Ridge, unless you want us to double the hill. Over.

   ZHOT is only making 19 mph coming by MP 276. We're going to need a helper to get up the hill at Ridge, unless you want us to double the hill. Over.

   This is the chief, do you want me to relieve you to take a break?

4. After the segment is over, stop the tape and have the participants write down what they can remember the engineer saying in the first video segment. Compare what was remembered to what was said on the tape as you play the tape again

5. Use the following questions to guide the discussion of the segment:

Q. Were you able to remember more of the engineer's request this time?

Q. What are other ways you can repeat the information given? Saying it out loud lets you hear it again.

6. Auditory /Tactile Memory Exercise: Have participants listen to Segment #3 (described below) on the Railroad Dispatcher Communications videotape. This time, allow them to take notes. As in the prior examples, a distracting request follows the transmission.

   Segment #3

   1818 east to the dispatcher, we have a couple of high-wides behind the power we have to walk through Big Creek Bridge. Either track's ok there, but we'll need the westbound main through the tunnel at Hillside. Over.

   Dispatcher, this is Train 160, I need a time check please.

7. After the segment is over. Stop the tape and have the participants turn their notes face down and ask them to write down what they can remember the engineer saying in the third video segment. Ask them to write down as much as they can remember without looking at the notes first. Compare what was remembered to what was said on the tape as you play the tape again.

8. Use the following questions to guide the discussion of the segment:

Q. Were you able to remember more of the engineer's request than in the previous exercises?
Q. Could you remember it all even without looking back at your notes?
Q. Did visually seeing the written notes help store them in your mind?
Q. How can note taking improve your memory skills when you are working a position?

This segment will contain a group discussion of ideas and strategies that the dispatchers use on a day to day basis for storing vital information into their short-term memory.

Start the discussion by asking the participants:

> **Q.** Overall, what strategies or techniques do you find most useful for remembering key information when working a position?

List responses on the flipchart while encouraging the experienced participants to give suggestions to those with less experience on the job.

After listing and discussing techniques, distribute the handout on Memory Techniques and go over the different ways you can improve your short-term memory.

Memory Techniques

- **Rehearsal**- Rehearsal is an effective technique for storing small amounts of information in your short-term memory. Rehearsal can come in different forms such as repeating the information over and over again in your mind, saying it out loud, and writing it over and over again. To change information from short-term to long-term memory, it must be repeated 20-21 times.
- **Chunking information**- Chunking involves breaking a string of information down into smaller chunks. Chunks should be no longer than seven units long. The rule for chunking is " seven +/- two". American phone numbers are an example of this type of chunking. The numbers are seven digits long, but broken up into a prefix of three and then a four digit personal number. 6473479 is easier to remember if it is broken up into 647-3479.
- **Associations**- If the information can be connected to something personal to you such as your last name or your spouse's favorite number it will be helpful in remembering. Italy is recognizable in geography because it is in the shape of a boot. These types of associations are called mnemonic devices.
- **Combining visual, auditory, and tactile memory**-What you hear and what you see involve different types of memory. If you use as many senses as possible to code the same information the chances of remembering it will be greater. When given verbal information, say it out loud, write it down. By doing these things, you have said it, heard it spoken (again), used your tactile sense to write it and you have used vision to look at it once it's written.

9. Combined Skills Exercise: Have participants listen to Segment #4 (described below) on the Railroad Dispatcher Communications videotape. Explain that they are permitted to take notes and that they should try to use a skill discussed in the group session to remember the request. The segment contains a reading of a request given to a dispatcher by a locomotive engineer, followed by a distraction task that they should attempt to complete.

   Segment #4

   We've got the 2260 we need to come out at the pit and shove down to Nelson to run around our train. We've only got 22 cars, so we'll fit between the switches of the industry track. We'll run the power through the industry, tie on the train, and let you know when we're ready to go east. Over.

   A train crew has been working since 6:30 a.m. The current time is 3:15 p.m. How much longer can they work before a crew change is required?

10. After the segment is over, stop the tape and have the participants complete the hours of service question. Then, have the participants write down what they can remember about the engineer's request without looking at their notes. Compare what was remembered to what was said on the tape as you play the tape again.

11. Use the following questions to guide the discussion of the segment:

Q. What method did you use to remember?

Q. Did you have an easier time remembering than in the previous episodes?

Q. Was the method you used easy or more difficult than expected?

Q. In the hours of service question above, how much longer could the crew work?

A. If there is an 11 hours service limit the crew needs to change at 5:30 p.m., leaving the crew with two hours and 15 minutes of work time.

Handout: Memory Techniques

- **Rehearsal**- Rehearsal is an effective technique for storing small amounts of information in your short-term memory. Rehearsal can come in different forms such as repeating the information over and over again in your mind, saying it out loud, and writing it over and over again. To change information from short-term to long-term memory, it must be repeated 20-21 times.
- **Chunking information**- Chunking involves breaking a string of information down into smaller chunks. Chunks should be no longer than seven units long. The rule for chunking is " seven +/- two". American phone numbers are an example of this type of chunking. The numbers are seven digits long, but broken up into a prefix of three and then a four digit personal number. 6473479 is easier to remember if it is broken up into 647-3479.
- **Associations**- If the information can be connected to something personal to you such as your last name or your spouse's favorite number it will be helpful in remembering. Italy is recognizable in geography because it is in the shape of a boot. These types of associations are called mnemonic devices.
- **Combining visual, auditory, and tactile memory**-What you hear and what you see involve different types of memory. If you use as many senses as possible to code the same information the chances of remembering it will be greater. When given verbal information, say it out loud, write it down. By doing these things, you have said it, heard it spoken (again), used your tactile sense to write it and you have used vision to look at it once it's written.

Handout: Memory Dynamics

MEMORY

Memory is our ability to store and retrieve information. Our memory holds all the things we know. Stimuli, or input, enter our mind from our environment through our senses. The brain changes the stimuli so that it can be stored, a process called encoding. Once encoded, the information enters into short-term or working memory. This is called short-term because it is not a permanent storage and retrieval house for information. Short-term memory is thought to have a limited amount of storage space and therefore if the information is not transferred into long-term memory, it will be replaced with the newest encoded input. Auditory working memory is thought to keep information for about 18 seconds and visual working memory keeps information only a few seconds unless the person actively keeps the information into short-term or commits it to long-term memory.

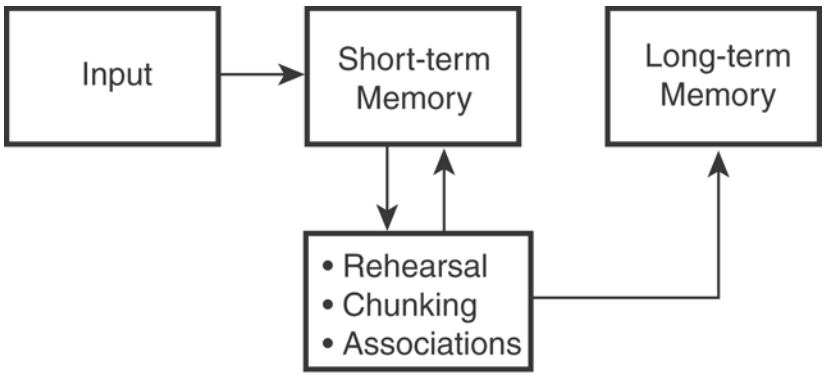
The information must make it to long-term before it is discarded. The primary way to actively place information into long-term memory is rehearsal. Repetition is not the only way that memories can get into long-term store, but it is the best way. Repetition is also a way to keep information active in short-term memory. Chunking and making associations are also ways to keep information fresh in your short-term memory.

Chunking is dividing up the information into sections that are easy to remember. The rule for chunking bits of information is "seven +/-two." This means that numbers should be kept to five to nine digits. Examples of this are social security numbers and American phone numbers. The phone numbers are seven digits long, but broken up into a prefix of three and then a four digit personal number. 6473479 is easier to remember if it is broken up into 647-3479.

Association can act like a trigger to help recall information. Information that you use or say often, such as your address, is never forgotten. However other things like your brother-in-law's birthday, are rarely called to mind and a trigger or association, such as it is the day before Halloween, is needed to remind you.

The information has a better chance of being stored and retrieved if the rehearsal involves as many senses as possible. Each of the five senses relates to its own type of memory. If you say a person's name out loud and write it down, you've used the senses of hearing, sight, and touch. Using multiple senses insures that the name is available for recall at a later time.

The memory system is very complex and involves some conscious and unconscious processes as well as physical activity of the brain. It may also involve or be affected by sleep and dreams. Here is a simplified model of how memory works:



Input refers to any stimulus that enters our senses; what you see, hear, touch, taste, or smell.

Encoding refers to the process of changing a stimulus such as sound or taste into a form our brain can store, much as keystrokes are changed into an electronic form a computer can store.

Short-term memory (STM) also called working memory, STM holds a small amount of information in our conscious awareness for a short period of time, approximately 12-15 seconds for most things, but it can be longer. When we look up a telephone number and remember it only long enough to dial it, we are using STM. We loose this information unless something is done to transfer the encoded stimulus into long-term storage. Using a form of rehearsal can actively facilitate this transfer.

Rehearsal is the conscious repetition of information. In addition to verbal repetition, creating a mental picture of the information and writing down the information are also forms of rehearsal. Rehearsal is the process we use to keep information, such as a telephone number, in STM. It is also how we send information from STM to long-term memory. Not everything has to be consciously rehearsed to transfer into long-term memory, but for the most part, we lose the input unless we make it stick. Take the telephone number, for example. Saying it over and over again, writing it down, and dialing the number are forms of rehearsal. Things must be rehearsed generally two to 22 times depending on the complexities of the information in order to transfer the encoded stimulus into long-term storage. The number of rehearsal times can be reduced by using elaborative encoding where associations are made to link the new information to information already in long-term memory and also by using multiple senses to rehearse.

Long-term memory (LTM) is our virtually limitless and permanent storehouse for information. When we want to remember a telephone number without having to look it up each time we dial it, we must rehearse the number until it becomes part of LTM.

Retrieval refers to the process of getting information out of LTM. Retrieving information from LTM is similar to retrieving information from the hard disk of a computer. Just as

we must know the file name under which information is stored in order to bring it up on our computer monitor, we must have an appropriate retrieval cue in order to activate information in LTM and bring it into our conscious awareness.

Retrieval Cues are information associated with what we are trying to recall. For example, the telephone numbers in our LTM are usually associated with the names of individuals or places of business. The names are the retrieval cues that help us recall the telephone numbers. Retrieval cues can also be certain mental images, sounds, flavors, odors, etc.

Note to Instructor

- Railroad phraseology includes several terms that have similar or identical meaning (e.g. Form 19 and Train Order) and dispatchers are expected to be familiar with them. Some of these terms are used industry-wide, others are used only in certain geographic locations or by certain railroads. Encourage participants to learn the terms on the general list as well as those on your local list.

- Choose general terms from the handout that are relevant to your operation.

Purpose

The purpose of this topic is to recognize and understand railroad terms that have similar or identical meaning.

Goal

- To maintain or improve participants' ability to recognize and understand railroad terms that have similar or identical meaning.

Approximate Time

½ hour

Materials

- ✓ Data on the local railroad terms with similar or identical meaning heard at this facility.
- ✓ Handout: One copy of the Handout for General Railroad Terms With Similar or Identical Meaning for each of the participants (see pages 49-50).
- ✓ Handout: One copy of the Handout for Local Railroad Terms With Similar or Identical Meaning for each of the participants
- ✓ Flipchart.

Instructions

1. Introduce the purpose of this topic.

2. Distribute copies of each of the Handouts for General and Local Railroad Terms With Similar or Identical Meaning to each participant.

NOTE: Use 15 - 20 minutes to discuss the content of the General list.

3. Divide the participants into two groups. Have both groups develop a list of the railroad terms with similar or identical meaning heard at this facility.

4. Compare the lists the two groups developed and list them on the flipchart.

Phraseology	Definition
#1 - 251 territory - Current of traffic	The movement of trains on main track, in one direction, specified by the rules.
#2 - An after-arrival train order - A meet order	A written form of train movement authority in which two trains meet at a designated point and may proceed as instructed in the order only after meeting at that point (usually one in a siding, one on the mainline).
#3 - Track and Time - Work and Time	Written instructions issued by a train dispatcher in CTC (centralized traffic control) territory to trains, men, or equipment, on the prescribed form, granting movement or occupancy authority, and protection, on main track, the use of which is governed by signal indication. Written instructions issued by a train dispatcher in DTC (direct traffic control) limits to trains, men, or equipment, on the prescribed form, granting movement or occupancy authority, and protection, on main track, the use of which is governed by signal indication.
#4 - Foul time – NORAC - Form B	Dispatcher may verbally authorize equipment to foul a track, if the work will not disturb the track or catenary structure Written On-track protection of workers, issued by dispatcher, but train may get verbal permission from the Track Foreman holding the permit to pass through the limits.

Topic 5 Handout: General Railroad Terms With Similar or Identical Meaning

#5 - Form D (GCOR) - Form D Control System (DCS) (NORAC) *(*same term, <u>different</u> meanings)*	-Written instructions issued by a train dispatcher to trains or engines (in the form of a track bulletin), providing information or instructions relating to the movement of trains that is not covered by timetable or special instruction. -Written instructions issued by a train dispatcher to trains, men, or equipment, on the prescribed form, granting movement or occupancy authority, protection, or to convey other instructions, including temporary speed restrictions, not covered in the Operating Rules, on the main track, used in territory designated by special instructions.
#6 - FRED (flashing rear end device) - EOT (end-of train device)	A portable transmitter unit mounted on the last car of a train which transmits data about brake pressure, state of motion of the last car, battery, and marker light status to the controlling locomotive.
#7 -VCS – voice control system -OCS – occupancy control system	Verbal authorization issued by a train dispatcher to trains, men, or equipment for occupancy of tracks where designated by special instruction (usually in yard limit territory).
#8 - Form 19 - Train Order - Track bulletin	Written instructions issued by a train dispatcher to trains, on the prescribed form, granting movement or occupancy authority, or advising of condition of main track, used in territory designated by special instructions.
#9 - Track warrant (GCOR) - Form D (NORAC)	Written instructions issued by a train dispatcher to trains or equipment, on the prescribed form, granting movement or occupancy authority, protection, or to convey instructions not covered in the Operating Rules, on the main track, in territory designated by special instructions.
#10 - Rule 93 - Yard limits	A portion of main track designated by yard limit signs and by timetable, train order, or track bulletin, which trains and engines may use as prescribed by Rule 93.

Topic 5 Handout: Local Railroad Terms With Similar or Identical Meaning

Phraseology	Definition

The idea of a formative assessment is to let instructor and participants know how they are doing. In this case, a scored but "un-graded" quiz is administered at the end of the first day of the course. (Because of the hands-on nature of the second day's material, no formative assessment is necessary or provided for that part of the schedule.)

Materials

The materials required are the Formative Assessment answer sheets and the instructor's guideline key. The guideline key is provided as an aid to support discussion-review of the quiz after administration.

Instructions

At the end of the first day, explain:

- A quiz will now be given as a way to summarize the day's discussions.
- The quiz is a way to help the participants to capture their own thinking about readback/hearback communication.
- The quiz is also a way for both participants and the instructor to check on their progress through the course.
- The quiz will be checked when everyone is done. There will not be a "grade" and no one other than the instructor will see the results.

Hand out the quizzes. Allow 10 minutes for completion. When everyone has finished answering the questions, indicate that the quiz will now be reviewed, with each person checking his or her own work. When the review is over, the instructor will collect the quiz.

Use the instructor's guideline key as a guide to conduct a discussion review. It is likely that the group will have come up with additional or different interpretations as a result of their own contributions during the day and these should be considered as admissible. The aim of the review activity is not to determine "right or wrong" but rather to provide a summary of the day's activities. Reassure the participants that there is no "grade."

When the review is complete, collect the quizzes and inspect the participants' responses. The four questions represent the four major topics of the day. How well did they respond? If there is a weak area, there may be a number of causes. Consider the following issues:

1. Do the questions actually reflect what went on during the class, or did the activities stray from the formal topics? If so, did the class activities enhance or detract from the intended goal of the course to help dispatchers to avoid and correct errors in communication?

2. Is there a problem with the way that the questions are worded? Could they be better phrased?

3. Did anything occur that caused some or all of the participants to be inattentive? Were the conditions under which the participants attended the class ones that could have made them uncooperative?

4. Were any of the materials not well matched to the skill level and experience of the participants? Was anything either "over their heads" or overly simplistic?

If any of the above issues are true, consider revisions for future offerings of the course to avoid the problems that were encountered.

The Readback/Hearback Course
Answer Sheet for First Day Quiz

Directions: Please write your name on the line provided below. Write your response to each question in the box. You may use the reverse side of the page if you need more room.

Name:_____

1. We discussed how the personalities of the dispatcher and track occupants could cause communication problems. What kinds of personalities are likely to cause these problems?
2. We discussed how the way that the dispatcher and track occupants manage their use of language or expressions could cause communication problems. What kinds of errors in usage or expression are likely to cause problems?
3. What kinds of things that are not under the direct control of the dispatcher or the train crew can also cause problems in communication?
4. What are some strategies the dispatcher can use to combat the problems you listed in number 3?

Formative "Quiz" Guideline Key

1. We discussed how the personalities of the dispatcher and track occupants could cause communication problems. What kinds of personalities are likely to cause these problems? **Uptight or irritable** **Tentative or unsure** **(and as suggested during the day by the course participants)**
2. We discussed how the way that the dispatcher and track occupants manage their use of language or expressions could cause communication problems. What kinds of errors in usage or expression are likely to cause problems? **Use of slang expressions** **Too much information** **Fast or monotone talkers** **(and as suggested during the day by the course participants)**
3. What kinds of things that are not under the direct control of the dispatcher or the train crew can also cause problems in communication? **Interfering noise** **Interruptions** **Unintended responders (other crews on the radio channel)**
4. What are some strategies the dispatcher can use to combat the problems you listed in number 3? **Ask for repeat of readback** **Connect information to an item (track display, mental picture, notes)** **Group information in a logical order (sequential, priority, etc.)** **Avoid "hearing what you expect to hear"**

Note to Instructor

- Remind participants to require complete and accurate readback of authority.
- Remind participants of the importance of ***readback/hearback.***

Purpose

The purpose of this topic is to identify the most common readback/hearback errors made at this facility and determine possible ways to avoid these errors.

Goal

- To develop strategies for avoiding common readback/hearback errors.

Approximate Time

1 hour

Materials

✓ Data on the common readback/hearback errors made at this facility.
✓ Flipchart.

Note to the instructor:

The course materials used for exercises and the tests have the following error types. It is not essential that the course participants use the following terms, but you should make certain as you lead the discussion that the following types of errors get discussed. If the participants come up with other terms to refer to these error types, go ahead and use the participants' terms.

Wrong recipient – confusion in radio exchange due to an additional and unintended party in the exchange. Only 4 percent of the errors covered in the course are of this type.

Transpositions – an example of a transposition would be #415 for #514 or "northbound train on south lead" becoming "southbound train on north lead." Transpositions of state (true/false, yes/no status) are also included here, such as "enter station" for "do not enter station." 6 percent of the errors in the samples are of this type.

Homophones – a homophone is defined here as the confusion of two expressions that sound the same such as "head ten" for "head pin." 8 percent of the errors in the samples are of this type.

Substitutions - This error is defined as simply substituting incorrect information for correct information in an exchange. This is the most common type in the course samples, with 55 percent of the errors falling in this category.

Omissions – This error is defined as leaving part of the information out of a response. This is also a common type, with 27 percent of the errors in the samples falling in this category.

Instructions

1. Introduce the purpose of this topic.

2. Review the following model to the group (refer to handout from Topic 1):

Dispatcher: Issues authorization.
Track Occupant: Acknowledges, and repeats authorization content **(readback)**.
Dispatcher: Acknowledges, or, if necessary, corrects track occupant's readback **(hearback)**.

Readback error occurs when track occupant repeats authorization content incorrectly.
Hearback error occurs when the dispatcher confirms a track occupant's incorrect readback.
Readback/hearback error is the general term we will use to refer to a communication error between dispatcher and track occupant.

3. Divide the participants into two groups. Have both groups develop a list of what they think are the 10 most common readback/hearback errors made at this facility.

4. List the errors on the flipchart.

5. Compare the lists the two groups developed to the data on errors identified during tape-replay analysis or other means used at your facility. Make any necessary additions to the list.

6. Have the participants work in their small groups. Have both groups determine the possible causes of each type of readback/hearback error identified and what can be done to avoid this type of error. When the participants have determined the cause of each error and the remedy for each error, have them present the situations to the entire group

7. List responses on the flipchart.

Note to Instructor

- Remind participants to require complete and accurate readback of authority.
- Remind participants of the importance of ***readback/hearback***.

Purpose

The purpose of this topic is to provide refresher practice in identifying readback/hearback errors.

Goal

- To maintain or improve participants' listening skills with regard to readback/hearback and other everyday dispatcher communications.

Approximate Time

1 ½ hours

Materials

✓ Railroad Dispatcher Communications videotape, cued to "Topic 7".
✓ Videotape player and monitor.
✓ Handouts: One copy of each of the Handouts for Identifying Readback/Hearback Errors, Segments #1 and #2, for each participant (see pages 70 and 71).

Instructions

1. Introduce the purpose of this topic.

2. Tell the participants that you are about to play a tape of a dispatcher communicating with track occupants and other dispatchers. (NOTE: Transcripts of the tapes used in this topic are provided for your reference but should not be distributed to the group.). Instruct the group to listen to the tape and mark on their Handouts whether each readback/hearback is correct or incorrect.

3. Start the tape and play the first segment in its entirety.

Segment #1:

1. Lots of background noise, radio traffic – high safety criticality.

Amtrak Train:	Dispatcher, Amtrak coach-yard light engine wants to go south from wrong main to the diesel shop, over.
Dispatcher:	Who called me? Come again, over?
Switcher Engine:	WR 227 to dispatcher, ok to come on the main and go south, over?
Dispatcher:	Ok to open up and head south. Call when you're in the clear, out.
Amtrak Train:	Head south, call when I'm in the clear, out.

---

2. Same scenario as above – high safety criticality.

Dispatcher:	OK for the BN 1224 to use the northward track from the north end of south Seattle, over.
BN engine 1224:	OK to use XXXXX (unintelligible to the dispatcher) …south Seattle, over.
Dispatcher:	Come again 1224, you got stepped on, over.
BN engine 1224:	OK to use XXXXX (unintelligible to the dispatcher) …south Seattle, over.
Dispatcher:	You're gonna have to try it again, 1224, over.
BN engine 1224:	(increasingly agitated) OK to use XXXXX (unintelligible to the dispatcher) … Seattle, over.
Dispatcher:	Maybe you better wait a few 'til the air clears, 1224. I'm not getting a complete transmission from you, over.
BN engine 1224:	(yelling now) OK TO USE THE SOUTHWARD TRACK FROM THE NORTH END OF SOUTH SEATTLE, over!
Dispatcher:	1224, I gave you that permission 10 minutes ago, out.
BN 1224:	Okay, out.

3.

Dispatcher:	241 North, two four-one N-O-R-T-H, at 0900, oh-nine-hundred, you are authorized to proceed in one block, Alpha, over.
Train 241 North:	241 North is authorized to proceed in one block, Alpha, at 0900, oh-nine-hundred, over.
Dispatcher:	That's right, 241 North. Out.

---

4. Similar sounds – high safety criticality

Dispatcher:	Train 16, engine twenty, two-naught, stop at Springfield, over.
Train 16:	Train 16, do not stop at Springfield, over.
Dispatcher:	Okay, number 16, dispatcher out.

5.

Dispatcher:	BAR 220, set the 6 stone cars off on the L track to clear the Fuel track. Now I show there are 2 cars on the L-Lead – you're going to have to make the hitch with them, shove the cars in the clear of the Fuel, over.
BAR 220:	Set off the 6 stone on the L, tie on to 2 cars on the L-Lead, shove them all clear of the Fuel track, over.
Dispatcher:	That's correct, BAR 220, dispatcher out.

6.

Y20117:	Dispatcher, this is Y20117, we're in emergency here at Riverdale, over.
Dispatcher:	Okay Y20117, train went in emergency at Riverdale. You got nothing coming against you. Give me a call after you've checked your train; I'll protect against opposing trains, over.
Y20117:	Thanks dispatcher, no need to protect our train. We'll call as soon as we check the train. Y20117 out.

7.

Dispatcher:	Extra 1724 west – Okay to make the pick up on #1 west at Church Street, holding on to your head-10 cars, over.
1724 West:	Okay to make the pick up on the headpin, over.
Dispatcher:	Okay to that, out.

8.

Dispatcher:	Dispatcher to train number 152, over.
No. 152:	152, go ahead, over.
Dispatcher:	152 make an employee stop at Cleveland– pick up a machinist who's going to be riding with you, over.
No. 152:	OK, dispatcher, employee stop at Cleveland to pick up the machinist. Out.

9.

Dispatcher:	Dispatcher calling CV Extra 4550 South, over.
CV 4550 South:	CV 4550 South, over.
Dispatcher:	CV 4550 South you have a 14 car pick up at the Oil Company in Burlington, that's six cars on the Fuel track and eight on the Delivery. Bills are in the box, over.
CV 4550 South:	Okay dispatcher, 14 car pick up at the Oil Company in Burlington, six cars on the Fuel track and eight on the Delivery. Bills in the box, over.
Dispatcher:	Okay 4550, out.

---

4. When Segment #1 has ended, stop the tape and rewind to the beginning of the segment. Ask a volunteer for his or her answer for the first communication, and
confirm or correct the answer using the Answer Key. Replay the message as you go over the answer. Repeat this process for each communication in Segment #1.

5. When you have reviewed the answers for Segment #1, ask the group the following general questions and list the responses on the flipchart:

> **Q.** What types of readback/hearback errors did the dispatchers and track occupants make?

> **Q.** Were these readback/hearback errors typical of those you have heard on the job?

> **Q.** What is the most common cause of readback/hearback errors?

> **Q.** What techniques do you use to clarify partial or inaccurate readback/hearbacks?

6. Next, play Segment #2. For this Segment, ask the group whether each readback/hearback is correct or incorrect, but also ask why any wrong readback/hearbacks are incorrect.

Segment #2:

1.

Dispatcher:	Train number 124, stop at Tower A and pick up a package that's going to Salem Tower, over.
Number 124:	Okay dispatcher, pickup at Tower A to be dropped off at Salem Yard, over.
Dispatcher:	Thanks, out.

2.

Dispatcher:	Operator at New Haven, 19 West, copy 2, over.
Opr New Haven:	Ready to copy dispatcher, over.
Dispatcher:	Train order number 112, one-one-two, to C&E no. 1507 at New Hope. Do not exceed thirty, three-zero, miles per hour between CP 266, two-six-six and Hamilton on number 2, two track. Signature DGM over.
Opr New Haven:	Train order number 112, one-one-two, to C&E no. 1507 at New Hope. Do not exceed thirty, three-zero, miles per hour between CP 266, two-six-six and Hamilton on number 2, two track. Signature DGM over.
Dispatcher:	Okay, complete at 0425 DGM, out.
Opr New Haven:	Complete 0425 DGM, operator Jones, out.

3.

Dispatcher:	YPRE 67, you need to pick up 19 Readings on track 11, holding on to your Mohawk block. I've got another crew working on track 10, the north end, so watch yourself, over.
YPRE 67:	Pick up 19 Readings on track 11, holding on to our Mohawks; got another crew working on the north end of 10, the north end, over.
Dispatcher:	Okay YPRE, out.

4.

T39T5:	Dispatcher - this is T39T5, we got three cars on the ground here at Davis; TILX 400110, TCDX 11058 and ADMX 15457. No dangerous. They're off pretty bad, the conductor's on the ground now checking them out, over.
Dispatcher:	Okay T39T5, the TILX 400110, TCDX 11058 and ADMX 15457, no dangerous, I'll try to raise the trainmaster and head him towards the yard. Out.

5.

Dispatcher:	EJ&E switcher engine 334, use caution over Miller Avenue at Main; the crossing protection must be activated 20, t-w-e-n-t-y, seconds before the crossing may be occupied, over.
EJ&E 334:	Use caution over Miller Avenue at Main; the crossing protection must be activated 20, t-w-e-n-t-y, seconds before the crossing can be occupied, over.
Dispatcher:	Okay, out.

6.

IHB 449:	IHB 449 to dispatcher, we'd like to come off the Walker lead and go towards the wye leading to the CSX westward main, over.
Dispatcher:	449, ok to proceed towards the wye, let me call the CSX and get permission to line you towards the main before I give you permission to hand throw the switch at Kennedy Avenue, over.
IHB 449:	Okay dispatcher, permission on the wye and the hand throw switch at Kennedy Ave, over.
Dispatcher:	Okay, out.

7.

Dispatcher:	Engine 204 North has until 0900 to run extra Jefferson to Raven on single track, protecting against extra 300 South after 0830, over.

Train Crew:	Engine 204 North has until 0930 to run extra Jefferson to Davis on single track, protecting against extra 300 South after 0830, over.
Dispatcher:	Okay, out.

8.

Dispatcher:	Extra 1717 West may pass the Stop signal at FX and proceed from the westward track to the eastward track in accordance with rule 629, dispatcher GSP, over.
Extra 1717:	Extra 1717 West may pass the Stop signal at FX and proceed from the westward track to the eastward track in accordance with rule 629, dispatcher GSP, over.
Dispatcher:	Time issued 0744, out.
Extra 1717:	Time issued 0744, out.

---

9. Foreman calling from a wayside telephone – high safety criticality

Track Foreman Jackson:	Foreman Jackson to dispatcher, I've got lineup 010 here between Douglas and Riverside 1201 until 1600. I'm going to work on the westward track until 1500, but I'm not exactly sure which is the westward track, over.
Dispatcher:	What's your location now, over?
Track Foreman Jackson:	The station sign says "Harrison," over.
Dispatcher:	Ok, the first track you see there next to the platform is the westward, the track farther away is the eastward and the track on the other side of the depot is the house track, over.
Track Foreman Jackson:	West, east, house – okay, dispatcher, east, west, house, over.
Dispatcher:	Okay, out.

---

7. Go over the answers to Segment #2 as you did with Segment #1. Ask the group the following questions and list the responses on the flipchart:

Q. What types of readback/hearback errors did dispatchers and track occupants make?

Q. What are the most difficult readback/hearback errors to detect?

Q. What relationship is there between incorrect readback/hearbacks and your workload?

Q. What problems have missed readback/hearbacks caused you?

Answer Key

Identifying Readback/Hearback Errors, Segment #1

Call Sign/Dispatcher	Correct		Error
	Yes	No	
1. Amtrak Train		X	Amtrak read back instructions intended for the switcher engine crew. (Wrong Recipient)
2. BN 1224		X	Was authorized by the dispatcher to use the northward track, not the southward, at the north end of south Seattle. (Substitution)
3. 241 North	X		
4. Train 16		X	Train crew interpreted "two-naught" as "do not". (Homophone)
5. BAR 220	X		
6. Y20117	X		
7. 1724 West		X	Incorrectly repeats to the dispatcher the instruction to pick up on the "headpin" (behind the engine) instead of holding on to the "head 10" cars. (Homophone)
8. No. 152	X		
9. CV 4550 South	X		

Answer Key
Identifying Readback/Hearback Errors, Segment #2

Call Sign/Dispatcher	Correct		Error
	Yes	No	
1. No. 124		X	Train crew incorrectly repeats location of package drop-off as Salem Yard instead of the Tower. (Substitution)
2. Opr New Haven	X		
3. YPRE 67	X		
4. T39T5	X		
5. EJE 334	X		
6. IHB 449		X	IHB 449 incorrectly reads back that they had permission to throw the switch at Kennedy Ave. (Substitution)
7. Extra 204 North		X	Incorrect readbacks for time (0930 instead of 0900) and location (Davis instead of Raven). (Substitution)
8. Extra 1717	X		
9. Foreman Jackson		X	Incorrect readback of location (east, west, house instead of west, east house) (Transposition)

Topic 7 Handout: Identifying Readback/Hearback Errors, Segment #1

Instructions: Determine if the readback/hearback is correct.

Call Sign/ Dispatcher	Correct?	
	Yes	**No**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

Instructions: Determine if the readback/hearback is correct. Identify any errors you detect.

Call Sign/ Dispatcher	Correct?		Error
	Yes	No	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

Note to Instructor

- Remind participants to require complete and accurate readback of authority.
- Remind participants of the importance of **readback/hearback.**
- When a readback error is detected, the dispatcher may shift attention to correcting the error and stop actively listening to the rest of the readback. This can lead the dispatcher to overlook a second, potentially more dangerous, error.
- Encourage participants to actively listen to the complete readback.

Purpose

The purpose of this topic is to provide refresher practice in identifying multiple readback/hearback errors.

Goal

- To maintain or improve participants' listening skills with regard to multiple readback/hearback errors and other everyday dispatcher communications.

Approximate Time

1 hour

Materials

✓ Railroad Dispatcher Communications videotape, cued to "Topic 8".
✓ Videotape player and monitor.
✓ Handout: One copy of the Handout for Identifying Multiple Readback/Hearback Errors, Segment #1, for each participant (see 67).

Instructions

1. Introduce the purpose of this topic.
2. Tell the participants that you are about to play a tape of a dispatcher communicating with track occupants and other dispatchers. (NOTE: Transcripts of the tapes used in this topic are provided for your reference but should not be distributed to the group.) Instruct the group to listen to the tape and mark on their Handouts whether each readback/hearback is correct or incorrect, and why.
3. Start the tape and play the segment in its entirety.

1.

Dispatcher:	Train number 124, one-two-four, do not exceed 25, two-five, miles per hour on number 1, o-n-e track between Millers, M-I-L-L-E-R-S, and Parkers, P-A-R-K-E-R-S, over.
Train 124:	Train number 124, one-two-four, do not exceed 25, two-five, miles per hour on number 1, o-n-e track between Millers, M-I-L-L-E-R-S, and Parkers, P-A-R-K-E-R-S, over.
Dispatcher:	Okay 124, dispatcher out.

2.

Dispatcher:	Train number 71, over.
No. 71:	71, over.
Dispatcher:	71, the gate protection at West Clay Street is not working. You're going to have to stop and flag the crossing, over. There's a signal maintainer out there who may be able to protect the crossing, but I want **you** to flag it. Over.
No. 71:	Okay, dispatcher. Gates not working at East Clay Street. Signal maintainer at the crossing will flag it, over.
Dispatcher:	Number 71, that was West Clay, w-e-s-t Clay, over.
No. 71:	Okay, right dispatcher, West Clay, w-e-s-t, over.

3.

Foreman Smith:	Foreman to dispatcher, I'd like to get a permit to run Central to Stewart. Just a routine highrail inspection trip, dispatcher. Got the RC-75, over.
Dispatcher:	Okay – Form TC, permit number 12, one-two, date 3-13-00 to Track Car Foreman Smith at Central. Line R – Track Car number TC-75 run Central, C-E-N-T-R-A-L to Stewart, S-T-E-W-A-R-T, on Track number 2, t-w-o, until 1630, sixteen thirty. Other information: Follow extra 7901 west and extra 902 west, Dispatcher R-J-W, over.

Foreman Smith:	TC Permit number 12, one-two, date 3-13-00 to Track Car Foreman Smith at Pasco. Line R – Track Car number RC-75, Central, C-E-N-T-R-A-L to Stewart, S-T-E-W-A-R-T, on Track number 2, t-w-o, until 1630, sixteen thirty. Other information: Follow extra 7901 west, Dispatcher R-J-W, over.
Dispatcher:	Permit 12 complete at 1525, one-five-two-five, RJW, over.
Foreman Smith:	Complete 1525, over.

4.

Signal Maintainer:	Maintainer to District 2 dispatcher, I'd like to do a signal test at the diamond at Heatley; I'm going to need the interlocking and put a shunt down, over.
Dispatcher:	Maintainer Jones, ok to put a shunt down in the interlocking at the diamond at Heatley, let me know when you're done, over.
Signal Maintainer:	Dispatcher, let you know when I'm done with the test. Out.

5.

Track Foreman:	Track car Foreman Gandy to District 3 dispatcher, I'd like a permit to run Park Street to Burney, over.
Dispatcher:	Okay, Foreman Gandy, Track Permit number 54, five-four granted on main track between Park Street and Baring 1240 until 1340, over.
Track Foreman:	Forman Gandy, Track Permit number 154, one-five-four granted on main track between Park Street and Burney 1240 until 1340, over.
Dispatcher:	Complete at 1240, TAW, over.

6.

Dispatcher:	Train 4473, Foreman Brown using track bulletin number 19 line 4 between Clair C-L-A-I-R and Fulton F-U-L-T-O-N on number 1 o-n-e track. Train 4473 may pass red flag located at MP 32.4, three, t-w-o, decimal, four without stopping, over.

Train 4473: Foreman Brown using track bulletin number 15 line 4 between Clair C-L-A-I-R and Dalton D-A-L-T-O-N on number 1 o-n-e- track. Train 4473 may pass red flag located at MP 32.4, three, two, four without stopping, over.

Dispatcher: Okay, at 530 p.m., out.

7.

Dispatcher: Train number 3301, I've got the switch out of correspondence at Deacon Junction. You have permission by the signal at Deacon, eastward main track to eastward branch track, and you'll have to take the power off the switch and hand-throw it, line and lock it for the branch, over.

Train 3301: Train number 3301 has permission by the signal at Deacon, eastward main to eastward branch track, taking the power off the switch at Deacon Junction, put it on hand-throw and line and lock it for the branch, over.

Dispatcher: Okay 3301, no need to restore the power to the switch, leave it on hand-throw, over.

Train 3301: Okay, leave the switch on hand-throw. 3301 out.

8.

Train 401: Train 401, District 2 dispatcher, we've got our equipment blocked in here on number 4 house track by a string of three freight cars that look like they may have rolled down to foul the house lead, over.

Dispatcher: Can any of the passenger equipment get out of the yard? What about Track one, over?

Train 401: I should be able to get that set out, but it only has three cars and we need the 6-car set, over.

Dispatcher: Look, take the set off of 1, but first I want you to set the hand-brakes on all the freight cars so they don't roll any further, over.

Train 401: Okay dispatcher, tie up the brakes on the freight cars, then take the set of equipment on 1. Out.

9.

Dispatcher:	Extra ST engine 355, passenger train number 255 is running about 22 minutes late out of the last station; they may make up some time and could be running about 15 late by the time they make Lincoln station, so you'll need to hold clear since it looks like you'll be coming on their time, over.
ST 355:	Okay, 255 running 15 late, no need to hold clear of the passenger station at Lincoln, over.
Dispatcher:	355, that's 22, two-two minutes late out of the last station, over.
ST 355:	Okay, 22 late. Out.
Dispatcher:	Dispatcher out.

10.

Dispatcher:	Track and Time Permit number 34, three-four, to engine WP 434 at Essex from CP 201 main track to CP 233 main track, blocked until 1615, GSP, over.
WP 434:	Track and Time Permit number 34, three-four, to engine WP 434 at Essex from CP 201 main track to CP 233 main track, blocked until 1615, GSP, over.
Dispatcher:	Okay at 1325, dispatcher GSP over.
WP 434:	Okay at 1325, GSP over.
Dispatcher:	Okay, out.

4. When you have reviewed the answers to Segment #1, ask the group the following questions and record the responses on the flipchart:

> **Q.** What were the most difficult multiple readback/hearback errors to detect?

Topic 8: Identifying Multiple Readback/Hearback Errors

Q. Were these multiple readback/hearback errors typical of those you have heard on the job?

Q. What techniques do you use to clarify partial or inaccurate readback/hearbacks?

Q. What relationship is there between multiple readback/hearback errors and your workload?

Answer Key
Identifying Multiple Readback/Hearback Errors

Call Sign/Dispatcher	Correct		Error
	Yes	No	
1. No. 124	X		
2. No. 71		X	Dispatcher catches the wrong crossing location (crew repeats East instead of West) but misses the incorrect readback about the necessity of protecting the crossing. (2 Substitutions)
3. Foreman Smith		X	Dispatcher incorrectly assigns permit to TC-75. Foreman Smith incorrectly excludes extra 902 West from his readback. (Substitution, Omission)
4. Signal Maintainer Spry	X		
5. Foreman Gandy		X	Incorrect readbacks for permit number (154 instead of 54) and location (Burney instead of Baring) (2 Substitutions)
6. Train 4473		X	Incorrect readbacks for bulletin number (15 instead of 19) and location (Dalton instead of Fulton). (Substitution, Homophone)
7. Train 3301	X		
8. Train 401	X		
9. ST 355		X	Incorrect readback for time (15 instead of 22). Incorrect readback of instruction to hold clear of station. (2 Substitutions)
10. WP 434	X		

Call Sign/ Dispatcher	Correct?		Error
	Yes	No	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Topic 9: Identifying Readback/Hearback Errors – Advanced Exercises

Note to Instructor

- Remind participants to require complete and accurate readback of authority.
- Remind participants of the importance of ***readback/hearback***

Purpose

The purpose of this topic is to provide more challenging practice in identifying readback/hearback errors. Distractors are added to make the exercises more difficult.

Goal

- To improve participants' readback/hearback skills under mentally demanding conditions.

Approximate Time

1 ½ hours

Materials

- ✓ Railroad Dispatcher Communications video, cued to "Topic 9".
- ✓ Videotape player and monitor.
- ✓ Handouts: One copy of each of the Handouts for Advanced Exercises, Segments #1, #2, and #3, for each participant.
- ✓ Copies of Bingo cards, one for each participant.

Instructions

1. Introduce the purpose of this topic.
2. Tell the participants that you are about to play a tape of a dispatcher communicating with track occupants and other dispatchers. (NOTE: Scripts of the tapes used in this topic are provided for your reference, but should not be distributed to the group. Answer keys for each of the exercises are included at the end of the topic.). Instruct the group to listen to the tape and mark on their Handouts whether the readback/hearback in each communication is correct or incorrect, and why the readback/hearback is wrong in any of the incorrect exchanges.

3. Start the tape and play the first segment in its entirety. Segment #1 uses footage of various trains as a distractor. Make sure the group can see the video monitor, but do not mention the distractor.

Segment #1:

1.

Train CCSWE01	South Shore Dispatcher, Train CCSWE01 would like to shove our train towards the main at Madison, make the cut on those bad order cars then set them off on the rip track. The car numbers are S-O-U 50132 and S-O-U 19056, over.
Dispatcher	Okay CSSWE01, I'll line you towards the main at Madison. Setting off 2 on the rip - S-O-U 50132 and S-O-O 19056. Let me know as soon as you're back on your train, over.
Train CCSWE01	Okay, dispatcher, let you know as soon as we've tied onto our train. Out.

2.

Dispatcher	Number 1012 I need you to make a "V" stop at Pelham, over.
No. 1012	That's "E" stop at Pelham, over.
Dispatcher	That's right, out.

3.

Dispatcher	Foreman, okay to put on at Dodge Street crossing, after the passage of train number 102, engine 1112, goes east, over.
Foreman George	Foreman George has permission to put on at Dodge Street crossing, after train 102, engine 1112, goes east, over.
Dispatcher	Okay, out.

4.

Dispatcher	LC48, engine IC 5044, the Tower spur track north of the southward dwarf signal at Wood is out of service further notice per instructions of Foreman Chase, over.
LC48	Tower track south of the southward dwarf signal at Wood out of service further notice per instructions of Foreman Chase, over.
Dispatcher	That's right LC48, out.

5.

Dispatcher	Track Warrant number 21, June 19, 1999 to C&E Engine WC 4414 North at Hart. Line 4, proceed from Hart, H-A-R-T, to Holmes H-O-L-M-E-S, on number 2, Track. Line 7, not in effect until after arrival of Engine CR 304 THREE, ZERO, FOUR, South, S-O-U-T-H, at Hart, H-A-R-T. Line 17, other instructions, call dispatcher at 1345, ONE, THREE, FOUR, FIVE, dispatcher RGE, over.
WC 4414	Track Warrant number 21, June 19, 1999 to C&E Engine WC 4414 North at Hart. Line 4, proceed from Hart, H-A-R-T, to Holmes H-O-L-M-E-S, on number 2, Track. Line 7, not in effect until after arrival of Engine CR 304 THREE, ZERO, FOUR, South, S-O-U-T-H, at Hart, H-A-R-T. Line 17, other instructions, call dispatcher at 1445, ONE, FOUR, FOUR, FIVE, dispatcher RGE, over.
Dispatcher	WC 4414, ok at 1230, dispatcher RGE, over.
WC 4414	Okay at 1230, copied by conductor Lafond, out.

6.

Dispatcher	The Rail Grinding Unit track car is authorized to operate at 50 miles per hour, not exceeding the maximum speed for freight trains and stopping at all spring frogs and proceeding at one mile per hour over them, over.
Rail Grinding Unit	Rail Grinding Unit car is authorized to operate at 50 miles per hour, not exceeding the maximum speed for freights and stopping at all spring frogs and proceeding at one mile per hour over them, over.
Dispatcher	That is correct, out.

---

4. When Segment #1 has ended, stop the tape and rewind to the beginning of the segment. Ask a volunteer for his or her answer for the first communication, and

confirm or correct the answer using the Answer Key. Replay the message as you go over the answer. Repeat this process for each communication in Segment #1.

5. When you have gone over the answers for Segment #1, ask the group the following questions and list the responses on the flipchart:

> **Q.** What effect did the visual distractions have on your ability to identify the readback/hearback errors?

> **Q.** What common distractions do you encounter when you are on the job?

> **Q.** What techniques do you use to focus your listening when you are on the job?

6. In Segment #2, footage from a film about wildlife is added to the audio exercise as a distractor. Inform the group that you will be asking questions about what is shown in this footage, in addition to the usual error identification exercise. Play Segment #2.

Segment #2:

1.

Dispatcher	Tower Operator at Queens, I have a slow order I need you to give to all eastbounds on number 2 track, over.
Tower Operator	Okay dispatcher, Stop displayed east - BDA switch number 42 east, 45 east and signals 7 and 5 east. Ready to copy, over.
Dispatcher	Okay on the BDA, 42, 47 east and signals 7 and 5 east at 1422. To C&E all Eastward trains at Queens. Do not exceed 25, two, f-i -v-e miles per hour on number 2, t-w-o track between Queens, Q-u-e-e-n-s and Valley, V-a-l-l-e-y, dispatcher VRE, over.
Tower Operator	To C&E all Eastward trains at Queens. Do not exceed 25, two, f-i -v-e miles per hour on number 2 track between Queens, Q-u-e-e-n-s and Valley, V-a-l-l-e-y, dispatcher VRE, over.

Dispatcher	Complete at 1424, VRE, out.

2.

Dispatcher	Authority to enter main track at Salem granted Salem Switcher engine 1724 for movement east, over.
Engine 1724	Okay, authority to enter main track at Salem granted Salem Switcher engine 1724 for movement east, over.
Dispatcher	Okay, out.

3.

Dispatcher	Form TC Permit number 44, four-four, date March 9, 1999 to Track Car Foreman Danson at Rosemont. Line R: Track Car number TC67, six-seven run Rosemont, R-O-S-E-M-O-N-T to Hall, H-A-L-L on eastward, e-a-s-t-w-a-r-d track and Hall H-A-L-L to Bradford, B-R-A-D-F-O-R-D on westward, w-e-s-t-w-a-r-d track until 355 p.m., three-five-five, over.
Foreman Danson	Form TC Permit number 44, four-four, date March 9, 1999 to Track Car Foreman Danson at Rosemont. Line R: Track Car number TC67, six-seven run Rosemont, R-O-S-E-M-O-N-T to Hall, H-A-L-L on eastward, e-a-s-t-w-a-r-d track and Hall H-A-L-L to Bradford, B-R-A-D-F-O-R-D on westward, w-e-s-t-w-a-r-d track until 355 p.m., three-f-i-v-e-f-i-v-e, over.
Dispatcher	Made complete at 330 p.m., three-three-zero by dispatcher WJS, over.
Foreman Danson	Made complete at 330 p.m., three-three-zero by dispatcher WJS, received by Foreman Danson, over.
Dispatcher	Okay, out.

4.

Train 44	Dispatcher 56, train number 44 would like permission to backup at Forbes station, we slid by the handicap ramp by about 4 or 5 car lengths, over.
Dispatcher	Train 45 ok to back up at Forbes, over.
Train 44	Ok on the reverse move at Forbes, out.

5.

Dispatcher	Signal Maintainer Lynch, I've got a track light on the westward track between Russell and Cove. I just had a westbound go by tell me they hit a rough spot around MP 89. I got one more westbound just out of Darden and an eastbound just coming by the Shop, over.
Signal Mtr Lynch	Okay dispatcher, track light on the westbound, check out a rough spot reported at around MP 89. Westbound is by the Shop with an eastbound passing the Shop now, over.
Dispatcher	Okay, let me know what you find, if you need some foul time or if I need to put a speed restriction out, over.
Signal Mtr.	Okay dispatcher, out.

6.

Dispatcher	Number 128, one-two-eight, I want you to hold back at West Morris station; number 218 is running about 12 minutes late, over.
Dispatcher	(without waiting for 128 to acknowledge) Number 218, two-one-eight, ok to come along into West Medford station, over.
Number 128	(thinking the Dispatcher just told him it was now ok to come into West Morris station) Okay, one-two-eight ok to come into the station at West Morris, over.
Dispatcher	Okay, out.

7.

Dispatcher	Extra UP 2701 North do not exceed 15, one five miles per hour on Passing P-A-S-S-I-N-G, track between Niles and Mile Post 15.5, one five point five, over.
UP 2701 North	Extra UP 2701 North do not exceed 15, one five miles per hour on Passing track between Niles and Mile Post 16.5, one six point five, over.
Dispatcher	Yes at 1130 a.m.dispatcher LMK, over.
UP 2701 North	Okay at 1130 a.m.dispatcher LMK, copied by conductor French, out.

7. When Segment #2 has ended, quiz the participants on the content of the video. The following are sample questions:

> **Q.** What kind of animals did you see in the video?

NOTE: The following animals appear in the video: moose, seals, mountain goats, bears, quail, antelopes, seagull, caribou, deer, yellow bird, insect, big horn sheep, elk, and prairie chickens, squirrel, red-winged blackbird, turkey, ducks, heron, geese, buffalo, turtle, beaver, rams, groundhog, baby prairie dog.

Then, review the audio exercise as you did for the first exercise.

8. In Segment #3, the distractor is a game of Bingo. (Option: To further motivate the students, offer a prize for winning at Bingo.) Pass out copies of the Bingo cards to the group. (Copies of the bingo cards are in Appendix A.) CARD #13 is a guaranteed winner. Explain that, while a similar audio exercise is heard, the participants must also look up to the video monitor where the Bingo calls will be displayed. (The calls will change about every 6 seconds.) Play the tape. (There will not be a winner until the audio exercise is finished.)

REMEMBER…CARD 13 IS THE WINNING CARD!

Segment #3:

1.

Dispatcher	Permission for train 701 to pass the stop signal at Welch and proceed from the number 2 t-w-o track to the number 1 o-n-e track checking for improperly lined switches and proceeding at restricted speed to the next block signal at 1655, Dispatcher RTO, over.
Train 701	Permission for train 701 to pass the stop signal at Welch and proceed from the number 2 t-w-o track to the number 1 track checking for improperly lined switches, and proceeding at restricted speed to the next signal, at 1655, RTO, over.
Dispatcher	Okay, out.

2.

Train 1504	Train 1504 to dispatcher, Cab signal at CP 257 flipped from Restricting to Approach-Restricting on number 2 track at Port, over.
Dispatcher	Cab signal at CP 257 flipped from Restricting to Approach on number 2 track at Port, take the more restrictive signal; I'll call the signal maintainer, over.
Train 1504	Okay, take the most restrictive signal. Out.

3.

Dispatcher	Pilot conductor you're going to send 2 westbounds, numbers 124, engine 1305, one-three-zero-five and number 146, engine 1500, one-five-zero-zero, ride the third train west, that is number 126, engine 1112, one-one-one-two, then you'll meet an eastbound at the Point, number 125, engine 1052, one-zero-five-two. Ride 125 east back to the Junction, over.
Pilot Conductor	Send westbounds, numbers 124, engine 1305, one-three-zero-five and number 146, engine 1500, one-five-zero-zero, and the third train west, number 126, engine 1112, one-one-one-two, ride number 125, engine 1052, one-zero-five-two, east to the Junction, over.
Dispatcher	Okay, dispatcher out.

4.

Dispatcher	YFX71 when you make your 27 car set off on number 36 Spur, you'll have to clear the leads on the west and east ends and cut the road crossing in the middle of the track, over.
YFX71	Okay, make the 27-car set off on 36 Spur, clearing the lead on the west end and cutting east of the crossing in the middle of the track, over.
Dispatcher	Okay YXF71, out.

5.

Dispatcher	Train number 444, I have a report of a broken fence at Anderson Farms and a report that there are sheep near the tracks. You'll have to run through that area at restricted speed, prepared to stop short of any sheep, over.
Train 444	Okay, report of a broken fence at Anderson Farms with sheep near the tracks. Run through that area at restricted speed, prepared to stop short of any sheep, over.
Dispatcher	Thanks 444, dispatcher out.

6.

Sperry Car	SRS-145, West End Dispatcher, we've found a defect here at Lloyd's on the number 1 track – we'll need to walk the next train over it then pull it out of service to change the rail, over.
Dispatcher	Give me an exact location, Sperry Car 145, over.
Sperry Car	Give the next train the location between CP 257 and the Powder House switch, over.
Dispatcher	Okay, number 1 track between CP 257 and the Powder House switch. After number 23 goes by, I can fix you up to take that track out of service, over.

7.

Train 1888	Train 1888 to dispatcher, we're stopped here at CP 229, ready to copy, over.
Dispatcher	No. 1888, one, eight, eight, eight, engine 67, six, seven, remain where you are standing on number 2 track at CP 229, two, two, nine until Extra 2008, two, zero, zero, eight east, e-a-s-t arrives, over.
Train 1888	No 1888, one, eight, eight, eight, engine 67, six, seven, remain where you are standing on number 2 track at CP 229, two, two, nine until Extra 2008, two, zero, eight west, w-e-s-t arrives, over.
Dispatcher	Okay, complete at 1339, SHM, over.
Train 1888	Complete at 1339, dispatcher SHM, copied by engineer Smith. Out.

8.

Dispatcher	Light engine 309, between CP 40, four, zero and CP 72, seven, two, Automatic Block Signal System on westward track out of service. Manual Block Signal System Rules in effect. Block stations established at Kirk, K-I-R-K, Swanson, S-W-A-N-S-O-N, Clyde, C-L-Y-D-E, and Garver, G-A-R-V-E-R, over.
Light engine 309	Light engine 309, between CP 40, four, zero and CP 72, seven, two, Automatic Block Signal System on westward track out of service. Manual Block System Rules in effect. Block stations established at Kirk, K-I-R-K, Swanson, S-W-A-N-S-O-N, Cline, C-L-I-N-E, and Garver, G-A-R-V-E-R, over.
Dispatcher	Okay at 1822, dispatcher LKB, out.

9.

Dispatcher	Engine 2008 two, zero, zero, eight east, e-a-s-t, run extra Patterson, P-A-T-T-E-R-S-O-N, to CP 229, two, two, nine. Block occupied. Extra 2008, two, zero, zero, eight east E-A-S-T, pass stop signal at CP 228, two, two, eight and proceed at restricted speed to CP 229, two, two, nine where number 1888, one, eight, eight, eight engine 67, six, seven stands disabled, over.
Engine 2008	Engine 2008 two, zero, zero, eight east, e-a-s-t, run extra Patterson, P-A-T-T-E-R-S-O-N, to CP 229, two, two, nine. Extra 2008 two, zero, zero, eight east E-A-S-T pass stop signal at CP 228, two, two, eight, and proceed at restricted speed to CP 229, two, two, nine where number 1888, one, eight, eight, eight engine 67 six, seven stands disabled, over.
Dispatcher	Okay 2008, complete at 1343, SHM, over.
Engine 2008	Complete 1323, SHM, copied by engineer Pope, out.
Dispatcher	Okay, out.

9. Review the answers to the audio exercise, and then ask the group the following questions and list the responses on the flipchart:

Q. What techniques did you use to keep track of both the audio segment and the Bingo game?

Q. What situations do you encounter on the job in which you must pay attention to more than one thing at a time?

Q. What techniques do you use on the job to handle these situations effectively?

Q. How do you prioritize when you find yourself becoming busy or distracted?

	Call Sign/ Dispatcher	Correct		Error
		Yes	No	
1	CCSWE01		X	Incorrect readback for car number (SOO 19056 instead of SOU 19056). (Substitution)
2	Train 1012		X	Incorrect readback for location ("V" instead of "E"). (Homophone)
3	Foreman George	X		
4	LC48		X	Incorrect readbacks for location (Tower track instead of Tower Spur track) and direction (south instead of north). (Omission, Substitution)
5	Train WC 4414		X	Incorrect readback for time (1445 instead of 1345). (Substitution)
6	Rail Grinding Unit	X		

Topic 9: Segment 2 Answer Key

Call Sign/ Dispatcher	Correct		Error
	Yes	No	
1. Tower Operator		X	Incorrect readbacks for switch number (47 instead of 45) (Substitution)
2 Engine 1724	X		
3. Track Foreman Danson	X		
4. Train 44		X	Incorrect readback for train number (45 instead of 44). Incorrect acknowledgement (Substitution, omission of train number in response)
5. Signal Mtr		X	Incorrect readback for location (westbound is past Shop instead of past Darden). (Substitution)
6. Train 128		X	128 incorrectly reads back instructions intended for 218. (Wrong recipient)
7. UP 2701 North		X	Incorrect readbacks for spelling (does not spell out "Passing") and location (MP 16.5 instead of MP 15.5).

Call Sign/ Dispatcher	Correct		Error
	Yes	No	
1. Train 701		X	Incorrect readbacks for spelling and signal location (did not specify block signal). (Omission)
2. Train 1504		X	Incorrect readback for speed (approach instead of approach restricting). (Substitution)
3. Pilot Conductor		X	Pilot conductor neglects to mention meeting at the Point. (Omission)
4. YFX71		X	Incorrect readback for track movement (clear the west and cut the east instead of clear the west and east). (Substitution)
5. Number 444	X		
6. Sperry Car	X		
7. Train 1888		X	Incorrect readbacks for engine number (t-w-o, z-e-r-o, e-i-g-h-t instead of t-w-o, z-e-r-o, z-e-r-o, e-i-g-h-t) and location (west instead of east). (Omission, Substitution)
8. Light engine 309		X	Incorrect readback for blocking device (Manual Block System Rules instead of Manual Block Signal System Rules) and location (Cline instead of Clyde). (Omission, Substitution)
9. Engine 2008		X	Incorrect readbacks for block occupancy (omitted "Block occupied") (Omission)

Topic 9 Handout: Advanced Exercises – Segment #1

Instructions: Determine if the readback/hearback is correct. Identify any errors you detect.

Call Sign/ Dispatcher	Correct?		Error
	Yes	No	
1.			
2.			
3.			
4.			
5.			
6.			

Instructions: Determine if the readback/hearback is correct. Identify any errors you detect.

Call Sign/ Dispatcher	Correct?		Error
	Yes	No	
1.			
2.			
3.			
4.			
5.			
6.			
7.			

Topic 9 Handout: Advanced Exercises – Segment #3

Instructions: Determine if the readback/hearback is correct. Identify any errors you detect.

Call Sign/ Dispatcher	Correct?		Error
	Yes	No	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			

Summative Assessment

The Summative Assessment is a repeat of the Pretest. Given that the participants were unaware that the pretest would be repeated, the repetition provides an opportunity to see if there were any changes in participant skills. Please refer to the pretest instructions to administer this test.

Scoring the summative assessment

If time allows, have each participant check his/her own test. Reaffirm that there is no "grading" and explain that the purpose of the test is really more about testing the effectiveness of the course than anything else. It is a matter of judgment as to whether the participants should be able to compare their pretest scores against their post-test scores. If participant scores on the pretest were universally high, then it might be counterproductive to make a comparison…as discussed below.

Evaluating pre and post test differences

If pretest scores were high (virtually everyone in the group with 9 or 10 correct), then it isn't reasonable to expect a change on the post-test. Statistically, it wouldn't be unusual if some individual scores actually decreased on retest under these conditions. This doesn't necessarily imply that the course was without value. As long as the participants were engaged with the material and have a positive response on the course evaluation form, the course then serves to affirm the value and importance of vigilance in communication.

It is not meaningful to calculate a class average for the pre and post-test if there are fewer than 15 or 20 participants. Typically it would be likely for the course to have no more than 5 or 6 participants. In this case, a single extremely high or low score in the group would easily affect a class average. This would mean that the average would not be a very good indicator of how everyone did as a whole. With small groups, it is often better to ask to what extent each individual improved. If 5 people participated in the class and the result was that 3 people improved, one stayed the same and one declined in score, it would be reasonable to say that qualitatively, the course appears to be effective. It is especially noteworthy if persons with low pretest scores show substantial improvements.

Another technique of evaluation for a small group would be to ask what the most common score was. For example, if 5 people had scores on the first test of 3, 5, 5, 5, and 7, the first test's most common score would be 5. If on the second test the scores were 4, 8, 8, 8, and 10 then the most common score would be 8. It would be safe to say that the skills of the group as a whole had increased.

If the pretest scores were not high (8 or higher) and the summary assessment scores did not show an increase, please consider the following questions:

1. What was the general course climate? Were there social or work factors that might have contributed to minimal engagement with the course for a substantial number of participants?

2. Was there anything confusing about the test itself that caused people to answer incorrectly?

3. Were the majority of participants attentive during the second day of the course? Could there have been anything about the way you conducted the class that might have made it better? Was there a sufficient amount of participant participation and interaction? Was there too much?

4. Is there any apparent relationship between participant performance and their evaluation of course and instruction on the course evaluation?

Course Evaluation

The purpose of the course evaluation is to provide some insight as to how the course or your delivery of it might be improved. The evaluation form is adapted from one used by the University of Washington to evaluate small discussion based classes. There are 22 questions on the adapted form. Questions 1 –7 and 19 – 22 cover the course structure and content. Questions 8 – 18 cover the instructor.

Materials

Course evaluation form.

Directions

After the summative evaluation has been administered and checked, hand out the Course Evaluation Forms. Explain that:

- The responses are anonymous.
- The date and location lines should be filled in (used as historical reference only).
- When completed, place the form face down (at a location away from the instructor). The last person should shuffle the order of the pages.

Interpreting the course evaluation results

The best form of course evaluation is to re-assess the participants some time after the conclusion of the course to see if outcomes observed at the end of the course continue to persist. In the case of this readback/hearback course, however, follow up of this kind just is not practical. In addition to the logistical problems, roughly half of the course is dedicated to changing the attitudes of the participants about the safety issues inherent in communications. But attitudes are notoriously difficult to assess in the context of a course, and certainly no less difficult as a follow up.

Given the limitations discussed above, the most common practice is to ask participants to evaluate the course by use of a questionnaire at the end of the course. The problem with the questionnaire approach is what is sometimes called "halo effect." If the participants have a relatively good time, they will rate everything high. Unfortunately, people can have a good time and not learn anything. Conversely, if people have to work harder than they anticipated, they might be less enthusiastic in questionnaire responses even though they actually learned useful skills.

Questions to ask yourself while reviewing the course evaluation forms:

1. Did the class fail to show improvement on the summative assessment (post-test)? If scores were low to medium on the pretest and really didn't improve much on the post-test, you should review the course evaluation forms carefully. Remember that questions 1 – 7 and 19 – 22 are about the course and questions 8 – 18 are about you. Consistently low responses on an item or range of items should be considered seriously. Try to think of ways to improve the course or your delivery of it.

   It can be difficult to read low evaluations of yourself as an instructor. Just remember that the evaluations are about your presentation style and not about your worth as a person. Low ratings on items 8 – 18 are simply hints for changes in your instructional style…this isn't a psychoanalysis!

   Finally, if the participants were forced to take the class on their own time or in place of being paid to do regular work, all bets are off!

2. Did the class show substantial improvement on the post-test and give both you and the course high ratings on the course evaluation? Congratulations are in order, but you should still look carefully at the course evaluation. What sorts of things got the highest ratings? How can you capitalize on these strengths to make the course even better?

3. Did the class have high scores on the pretest and give either you or the course low ratings on the course evaluation? If this is the case, the first consideration probably should be about the course content, particularly if items 1-7 and 19-22 received the brunt of lower ratings. The content may have been too simple or

somehow off target for the group. Content revisions are probably in order if this continues to occur in subsequent classes.

4. Were the class post-test scores OK and the course evaluation ratings sort of "above average?" If this is the case, you probably should take the individual question responses with a grain of salt. Typically, course evaluation responses are "above average" across the board with all items pretty much falling into this category. If you find one item or type of item to have lower ratings across the board, you might want to give it some consideration. Otherwise, keep in mind that course evaluation questionnaires are not terribly reliable. Scattered high or low ratings probably don't mean much.

Readback/Hearback Course
Answer Sheet

Directions: Please write your name on the line provided below. Listen as the taped exchanges are played. First, check either the YES or NO box to indicate whether you think the exchange was correct or now. If the exchange was not correct, then check the type of error or errors you think were made (there may be more than one type of error).

Name:_____

Sample #	Correct?		Type of Error
	Yes	No	
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Dispatcher Communications
Course Evaluation Form

Directions: On the lines provided below, please enter the date and location where the course was taken. Your anonymous responses to this form and the pre/post-test performance of the class will be used in consideration of any revisions in the course content or method of delivery.

Date the course was taken:_____

Location where the course was taken:_____

Please respond to each of the questions on the page that follows by checking the <u>one</u> box that best represents your response to each question.

		Excel-lent	Very Good	Good	Fair	Poor	Very Poor
1	The course as a whole was:						
2	The course content was:						
3	Course organization was:						
4	Use of class time was:						
5	Assessment procedures (pretest, quiz, final test) were:						
6	Quality of questions or problems raised was:						
7	Interest level of class sessions was:						
8	The instructor's contribution to the course was.						
9	The instructor's effectiveness in teaching the subject matter was:						
10	Instructor's preparation for the course was:						
11	Instructor as a discussion leader was:						
12	Instructor's contribution to discussion was:						
13	Instructor's enthusiasm was:						
14	Encouragement given students to express themselves was:						
15	Conduciveness of class atmosphere to student learning was:						
16	Student confidence in instructors knowledge was:						
17	Instructor's openness to student views was:						
18	Instructor's interest in whether students learned was:						

Relative to similar courses you have taken:

		Higher			Average			Lower
19	The intellectual challenge presented was:							
20	Your active participation in this course (entering class discussions, etc.) was:							
21	Relevance and usefulness of course content were:							
22	Amount you learned in the course was:							

B I N G O

11	27	44	72	64
4	31	40	70	60
3	9	φ	47	71
26	42	17	59	65
53	75	60	14	52

1

B I N G O

19	32	48	66	64
6	22	36	55	73
17	28	φ	11	77
18	50	41	62	60
28	31	46	68	15

2

B I N G O

8	20	31	9	60
11	43	45	33	64
71	42	φ	55	77
53	28	60	70	19
63	21	56	62	52

3

B I N G O

71	50	74	59	70
4	31	40	55	44
49	39	φ	11	14
6	22	46	62	15
26	20	56	51	64

4

B	I	N	G	O
26	31	41	70	60
16	50	59	25	64
4	63	φ	14	71
17	42	30	55	52
53	75	46	1	35

5

B I N G O

31	42	5	70	65
6	62	30	53	52
61	63	φ	17	64
3	20	60	55	77
71	22	59	51	24

6

B I N G O

18	55	40	11	57
71	27	62	70	60
3	31	φ	59	73
19	35	17	54	64
53	43	46	51	77

7

B I N G O

16	31	52	70	73
13	32	21	65	77
3	42	φ	11	43
71	22	60	47	15
6	12	51	55	64

8

B I N G O

49	63	4	59	14
31	42	40	11	70
26	55	φ	53	64
6	35	46	55	73
17	21	60	51	77

9

B I N G O

46	31	48	58	57
3	27	62	11	60
53	42	φ	14	59
6	28	40	7	52
74	57	17	55	64

10

B I N G O

20	31	23	1	72
3	75	48	22	60
4	22	φ	59	55
17	28	41	25	71
33	57	46	62	64

13