

# **Train Dispatcher Training: Preparing for the 21<sup>st</sup> Century**

**Transcription of a one-day workshop  
on training objectives and techniques  
to meet the challenges of 21<sup>st</sup> century  
train dispatching**

**Thursday, October 1, 1998  
Hyatt Regency O'Hare, Chicago, IL**

**Sponsored by:  
The Federal Railroad Administration  
Office of Research and Development**

**Hosted by:  
Foster-Miller, Inc., Waltham, MA**

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## **Welcome**

Judith Gertler, Manager, Human Factors, Foster-Miller, Inc.

Over the past year, really over the past few months, I've spoken with many of you and it's really a pleasure for me to meet all of you and see this whole group assembled here today. When we began planning this workshop, about a year ago, I told Tom Raslear that I thought we would have maybe 60, possibly 70 people. Well, I was wrong. Because I think we have something over 90, maybe even approaching 100 people here today. Our group includes representatives from government, the railroads, labor, consultants to the railroad industry, training institutions, and developers of dispatching systems.

The past twenty years have seen significant changes in the job of a train dispatcher. From the technology perspective, the availability of affordable computer systems made computer assisted train dispatching feasible. Improved communication systems led to the acceptance of radio transmitted directives in place of the traditional operator delivered train orders that had been used for over 100 years. Today's dispatcher is likely to use multiple computer screens and work with a keyboard and a mouse, in addition to a communications systems. But not all dispatching operations can be characterized as high tech.

A short line railroad may still use hand written or verbal authorities to move its trains across dark territory. A regional railroad may use a combination of CTC and computer-aided dispatching. Technology has also changed the training programs for dispatchers. Currently multimedia computer based training is used by both large and small railroads. Videotapes play a role in the classroom and self-directed training and simulators are frequently used to instruct trainees on the use of a computer-aided dispatching system.

As we all know, the traditional career path to dispatching has been from tower or block operator to dispatcher. But due to changes in signal technology and advances in centralized traffic control and computer aided dispatching systems the number of tower operators and other field personnel has declined, effectively eliminating this career path. As a result today many dispatcher trainees do not have prior railroad operating experience upon entering a training program. And this situation is not likely to change in the near future.

Over the past two years I have had the opportunity to visit a number of dispatching centers. Each center is unique because of size, or type of dispatching technology, or the type of traffic that's moved. Just as each center and each railroad is unique the dispatcher training program at each railroad has unique features. There certainly is no such thing as one size fits all when it comes to training programs.

Just as we have experienced some dramatic changes in railroad dispatching in the past twenty years, the future is certain to bring even more changes. How will advanced train control systems change the job of the dispatcher? And how will training programs instruct future dispatchers on the use of the new technology? Will the decrease in the cost of computer technology allow more widespread use of computer based training for dispatchers? Will changes in training programs be needed to accommodate the increasing number of trainees without railroad experience?

I hope that the program that we have put together today will provide the opportunity to explore these issues, as well as others that all of you contribute. I encourage all of you to actively participate by asking questions and sharing your ideas. In this way we can all maximize the benefit from today's activities.

Now I'd like to introduce Tom Raslear. Tom has served as an engineering psychologist and the Human Factors program manager in FRA's Office of Research and Development since 1993. In addition to managing FRA's train dispatcher training

research his office is overseeing the train dispatcher workload stress and fatigue project, which Foster-Miller is currently conducting. His other research projects concern locomotive engineer fatigue, locomotive cab working conditions, and human factors aspects of high speed rail operations. Prior to joining FRA Tom was a senior research psychologist and deputy chief of the physiology and behavior branch in the Department of Neurosciences at Walter Reed Army Institute of Research. Tom?

## **Goals for Today**

Thomas Raslear, Human Factors Program Manager, FRA

Thank you, Judy. Good morning and welcome to the workshop on railroad dispatcher training. As you already know I'm with the FRA's Office of Research and Development. I am the program manager for human factors. My office sponsors research to improve the safety, productivity, and competitiveness of the railroad industry.

I'd like to give you a little history about how we came to having this particular workshop. Following two Office of Safety audits of dispatching operations, the Office of R&D was asked to examine dispatcher training programs and make recommendations concerning minimum training standards for train dispatchers and minimum operating rule and testing standards. In 1996 we initiated a research study, under my direction, to provide a basis for making these recommendations. Later this morning Judy Gertler will tell you about part of that study, which she conducted.

This research study involved site visits and discussions with training officials at many railroads. In the process of collecting information about the industry's various training approaches we learned about the experiences of a variety of different types of operations. For the most part the railroads that Foster-Miller contacted as part of the study expressed the willingness to share their approaches. They also felt they would benefit from talking with other railroad officials involved in training dispatchers. Given this level of enthusiasm from a sampling of railroads, and the issues that Judy mentioned,

the FRA decided to sponsor this particular workshop. We hope that we are providing a forum where diverse groups, concerned about the training of future and current train dispatchers, can share their experiences.

I hope that each of you will leave at the end of the day with at least one idea that will help your organization to improve its approach to training dispatchers. From the FRA's perspective we hope that you will help us to identify the dispatcher training issues that the Office of Research and Development should focus on in the coming years. We've assembled a group of speakers for today's program that I think represents a range of perspectives on training for train dispatchers. I need to tell you first that there is a change in the program. The first speaker, Tom Keane from the FRA's Office of Safety, will present the FRA's expectations for this workshop. Then Judy Gertler will present the portion of the research project that Foster-Miller conducted for the FRA.

Next will be Steve Ditmeyer from the FRA's Office of Research and Development. So there's where the change comes in your program. All of the rest of the speakers will follow as originally planned but they'll be brought down by about a half hour. We have representatives from the Long Island Railroad, the Union Pacific, and CSX, who will each address aspects of their training program. Our lunch speaker will be Jim McQueen, the FRA Associate Administrator for Railroad Development. Our afternoon sessions include presentations from two non-railroad speakers; Andy Burton from the National Academy of Railroad Sciences will talk about using community colleges as a training resources and Henry Mogilka, an air traffic control specialist instructor, will talk some about the approaches used to train air traffic controllers, so that we have a contrast with regards to a different mode of transportation. We'll round out the afternoon with two panel sessions; one focusing on short line and regional railroads and a final session to identify training challenges as we move towards the 21st century.

People who have questions, and we encourage participation in this, we're trying to record all of the questions and the answers and the proceedings. We have speakers set up in the center aisle here. If you could please try to use the microphones to assist us in that regard, it will help us get everything down on tape and then we will have a full record of the proceedings.

## **FRA's Expectations for Dispatcher Training**

Thomas Keane, Railroad Safety Specialist, FRA

Our first speaker is Tom Keane. Tom is currently a Railroad Safety Specialist at FRA headquarters in Washington, with specific responsibilities for program management of train dispatcher training and qualification procedures. Tom is FRA's leading expert in all matters relating to train dispatching. In addition to the dispatching responsibilities that he has, Tom is involved with fatigue countermeasures and accident incident reporting. Tom began his railroad career as a tower operator for the New Haven Railroad in 1968 in the New York City area. The New Haven subsequently became part of Penn Central. In 1976 Tom was promoted to train dispatcher and later to a position of assistant rules examiner. In 1985 he came to the Federal Railroad Administration as an operating practices inspector, located in Charlestown, West Virginia. And later was transferred to Newark, New Jersey. In 1992 he was promoted to Operating Practices Specialist in Washington DC, with his specific area of responsibility being hours of service. Since that time Tom has assumed his current primary responsibilities as the program manager for train dispatcher training and qualification procedures. I give you Tom Keane.

MR. KEANE: Good morning. Like Tom said I've been involved in this for eons or about 13 years now. I have some very interesting projects that I was dealing with, got involved with it back in 1985 when we first did the first audit. Then we went on to one in



1993 and I was charged with that responsibility and it was a great opportunity for me to address some of the issues that dispatchers are facing today.

With that we're looking into the 21st century and I'd like to say the dispatchers today have played a crucial role in promoting safety and efficient rail systems. During the 1993 follow up review FRA found that generally the nation's train dispatchers are working-- They're working, competent professionals and doing a good job with on track maintenance and complying with the rules and having other people dealing with them to comply with the rules. So they're doing a good job, I just want to let you know that. We've done many audits and we've found this out.

In retrospect the railroad industry has experienced significant changes. Advancements in computer assisted dispatching systems and consolidation of dispatching offices have modernized the train dispatching working force and the tools available to do the job. The rail industry has corrected many of the significant problems we found during those audits that I just mentioned. However, changes train dispatcher technology and the loss of the traditional recruit dispatcher candidates has reduced and attracted involvement in primary areas; training and operational testing. Today I'm just going to talk about the training.

In 1985 we wrote a report to Congress, it's not in your folder, I just happen to have it with me, it's in my packet here. I can get you one if you want, just see me after the conference today. During that review we said that we would form a working group, made up of representatives from the ATDD, the BN, Amtrak and FRA. And many of those people are in this room today. Sandy McArdle is over here, on the right there; or my right, your left. Dan Bodeman, I saw him earlier today. There he is back there. Bob Hungerford in the back. And Bill Clifford. There were other people but they're not here today. I just happened to notice those four and I just figured I'd give them some recognition.

On April 30, 1996 the group that I just mentioned reached a consensus on recommendations for the training elements that are included in your packet. It should be in that little booklet. The group believes that these elements are adaptable to any size railroad. What I'd like this group to do today is to review the training elements and make suggestions or comments, indicating how FRA should progress toward providing a foundation for dispatcher training programs. What I'm going to do now is I'm going to go through the slides of the actual elements that are in there. And just bring up what we've done and what we've selected.

These training items are modular. This is not proposed to be a linear training outline. I'm not saying that this is an outline. You can move these elements around any way you wish. We're just saying that these elements should be included in a program, that's all we're saying. Evaluations should be thorough and at the end of each module, as well as at the end of each training cycle. So, in other words, look at what your people are doing during and after each cycle in the training process. The training should include the following suggested elements, but not be limited to these elements. In other words, you can add whatever you want to it later on but these are just the basic elements.

Train dispatcher job description; these are the overviews that they should have, the basic items. They should have introduction to the railroad, what the railroad is all about. An overview of basic railroading. A train dispatcher job description, in other words you tell them what they're going to do, what type of work they're going to be performing. We've found that some people are getting hired and being told that they're going to be a keypunch operator and that does not fit the description of a train dispatcher.

Railroad terminology and familiarization; we have a specific language in the railroad industry that's unique to us. A lot of people on the outside don't understand what's going on. For instance, I was in a restaurant one time and there was an elderly couple sitting next to me and then there were two wives, two locomotive engineer wives

were talking about their husband's dying last night. And the wife said to the husband, "Why are they so happy that their husbands died?". And what it was is they didn't understand our language.

Craft interaction; who does the dispatcher interact with. Who are they dealing with. The safety rules, you should include some safety rules in the elements, in the program rather. Personal protective equipment requirements. In other words, our people required to have certain kind of equipment and they call up and say they don't have it. They should-- Dispatchers should or a chief dispatcher should know where that item can be picked up for the crew. Company safety performance, what is required. Response to emergency situations, the carrier's procedures on emergency responses.

Federal regulations; provide copies to the dispatcher. We're not asking you to teach them everything that's in the Federal register or in the Federal regulations. Just give them a copy of it or excerpts from it so that they understand what they're dealing with. Knowledge of the Hours of Service Act, not only for themselves but for the crews and the signal maintainers. Disqualification procedures, what's involved. Drug and alcohol; they should know about that also because they're involved in it. Individual accident reporting; in other words some times at night, when there's no supervision around, the dispatcher becomes the supervisor and that's the person the individuals in the field or field supervisors are going to call to find out what forms they have to fill out or notify the dispatcher that they have an incident or an injury. Then the dispatcher will record that information in some format. They need to know what's required.

Hazardous materials on the trains; you know, paper work, placement, all of that needs to be known. Key trains, what are the key trains, that's mostly for the freight. Penalties against individuals, what's involved, how do I avoid being penalized by-- Myself being penalized as an individual.

Of course, they've got to know the operating rules of the railroad, the specific railroad. Then the dispatcher specific rules; what's involved with the dispatcher, what does the dispatcher have to know just for himself. Other craft rules, in other words like track rules and now that we're getting into railway protection and all that they need to know some of that stuff too. Operational testing requirements, some dispatchers are tasked with that responsibility. Conducting efficiency tests on not only their constituents but they're also tasked to do it on train crews and other people that they deal with.

Train control systems and how they work; the types of basic characteristics, the block signal systems. A lot of times they get calls on the radio about signal systems and what's functioning and what's not functioning. They don't really know if they're not taught. Highway grade crossing warning protections, we've got some new rules in that area, what's required. You know, speeds and that type of thing. Trackside warning devices; what do they do about them when they hear it.

Automatic power dual control switches in derails; a lot of times dispatchers are placed in a position and these items are out there for them to work with and they have no idea how to operate them. Or what to do when someone calls up and says hey, I need to know how to operate this switch out here. What do I have to do? Positive train control; we're looking at the future but something they need to know or some type of a-- I know in the Northeast Corridor here they have some form of positive train control. It's automatic block-- I mean, train stop, rather. So, items like that, the dispatchers need to know this stuff.

In electrified train territory, where applicable, the operating rules require physical characteristics of that territory, dispatching systems capabilities. A lot of times the dispatchers get the fundamentals but they don't know what to do in certain situations where the computer can allow them to do things and they're not familiar with it. They

don't have enough training or they weren't given or afforded enough training in operating the system itself.

Telecommunications; phones, radios, intercoms, digital data links, wireless communications, all of that type of stuff they need to know some knowledge in that. Command and control equipment capabilities; computer blocks, DPC, track ...(inaudible). Hazardous materials; emergency response procedures, they need some kind of reference guide or material that they need to do to get to the right response people. And get information about a product or a chemical or whatever, they need to know what to do. Because dispatchers are responsible for that type of stuff on many operations out here.

Accident reporting; I mentioned this earlier, train placement. Excessive dimension cars; a lot of times trains go through tunnels and they're too wide and they're derailling in tunnels or over bridges. And the protection and movement of excessive dimension equipment; what is the carrier's procedures for moving that stuff. How does the dispatcher find out this information, where does he get it from. Tell him where it's at. Engineering; physical structures, where are the dimensional locations. In other words, a dispatcher needs to know where not to operate a train over certain sections of a railroad. Physical structures; is it capable of holding the load, is it capable of making the speed of the track. I'm talking about a train now.

Periodic inspection and maintenance; they should have some knowledge, basic knowledge-- Now we're not talking about them going out there and performing this function themselves. Equipment types; what are the equipment types. There's a lot of new track equipment coming out on the market today that even some of us in FRA don't know what it is. So, that's the kind of equipment types we're talking about. I mean, some of these things are so huge they look like a train by themselves.

The mechanical side; now this is just for informational sake because a lot of times a dispatcher will get information from a train crew that something is wrong with their

train. And the dispatcher sometimes doesn't even know what they're talking about. But if they had some vague knowledge of what the function of what the components are they could form a better picture in their mind. Because dispatchers do work with pictures in their mind.

The cars; they should-- Familiarization with car components, the major components in their functions, what do they do, defects. Same thing with locomotives; familiarization with the locomotives. We're not talking about an extensive course here, we're just talking about familiarization. Again, this is just the basics, we're just talking basics here. Major components in-- The same as the cars. Locomotive defects, inspection and servicing; a lot of times the dispatcher will get a call hey, this locomotive I'm operating here is over 24 hours. There are certain requirements that the carrier has and certain requirements that the Federal Railroad Administration has. They need to know that, which one are they operating with. Are they operating with the company's or are they operating with the Federal.

Brake systems and how they work; a lot of times you'll ask people, say I've got sticky brakes or sparking out here, they need to know what's going on so they don't send out emergency responders for no reason whatsoever. It's just they need to know this. They need to know the types of brakes; air brake, hand brakes, electric brake. As a matter of fact, I'm going to a course on that in November. I'm going to learn about air brakes. Getting up there in the world, huh?

Hands on training; what we're saying here is always on any new territory introduced to the dispatcher, prior to the qualification. Knowledge of physical characteristics of the territory and there are several ways of doing it, depending on the size of the railroad and depending on the logistics of the railroad. You can do it by road trips, small railroads, close, and in inner city. Like Amtrak does it, Conrail does it.

Videos, track charts, or whatever, whatever is coming up. And that's why I'm asking you to help us in this area.

On the job training with the on duty dispatchers. They should sit down with the dispatcher and be able to sit down there and actually operate the machine, rather than just sit in the corner and have someone just tell them what they're supposed to do. The greatest thing in the world is to do something yourself and feel you've made a personal commitment or accomplishment. Final examinations, what it should include is operating rules and a review of the class that it's been involved with. And then give them the final exam. Give them an overview of what the test is going to be about. We're not saying to give them the answers but to give them an idea of what they're looking for in the test.

We also mention periodic retraining, we suggest it at three year intervals. We're saying that it should include, or in this case it said "must", but we'll say "should", should include but not limited to the following: operating rules, that's a no brainer right there. The mechanical, the Federal regulations. Again, give them some kind of material that they can work with. And hazardous materials, the same thing.

Additional instructions to be given when changes occur in the following areas: Federal regulations, give them updates, let them know what's going on out there. And electrified train operations, if you change anything, lower or raise the pantographs in a certain area, like in the Northeast Corridor here. Dispatching systems capabilities, in other words when you make changes to the system the dispatcher should know about it through some kind of a notification and also some type of instructional process. Not just give them a piece of paper and say here's the change. That's kind of a hard way to deal with it. Then give them mechanical, any changes you have in the mechanical area. That you'd maybe change an air brake system or something or some new type of equipment came out. Let them know about it.

That's it. Okay, there's one other thing I just wanted to bring up and it came up last night in several conversations. FRA at the present time is not looking to certify train dispatchers. Now, Congress may be pushing it but we haven't gotten any word on it yet. So, to just to mention it, that FRA-- Again, FRA is not looking to certify train dispatchers at this time. It may occur soon but not at this time. I have no knowledge of train dispatcher certification criteria yet. And that's about it on my presentation. Thank you for your attention.

MR. RASLEAR: Are there any questions from the audience? Any comments?

Q: Tom, you say you're not going to put out engineer certification standards at this time. Do you plan on publishing these training standards in any form to the railroads, officially? As recommendations or as an NRPN or what's the next step with this?

MR. KEANE: Well, the next step is-- Let me put it to you this way. My name is Thomas Keane, that's K-E-A-N-E, and my email address is [thomaskeane@fra.dot.gov](mailto:thomaskeane@fra.dot.gov). And what I'm looking for from this group and you can pass it on to other people, other friends, is some ideas of what we should do with the elements you have in your packet. I have no plans-- I mean, we can share them with anyone who asks for them. That's one of the reasons why they're in your packet, maybe you can pass them on to some of your other railroaders that are not here today. But officially, Federal Register-wise, no we do not, not at this time.

We attempted to present it to an RSAC Committee, which is the Railroad Advisory Committee, and it was tabled before it even got to the RSAC. I mean, basically, the training programs that are out there today have a lot of these elements in them. All we're saying if you don't have them, take a look at your program and maybe you should include them. But we're not saying this is what we want. We're saying these are suggested elements and you should include them in your program. Any other questions? Yes, Mr. McGill.



MR. MCGILL. Hi, I'm James McGill, American Train Dispatchers, Jacksonville, Florida. Mr. Keane, in the packet it showed there some things that are in reference to the training as far as road review was concerned. They're listed in there and I don't think that those were-- You say you made them as suggestions. There was one as far as train dispatchers are concerned that relates to road review via video. You say you want these new train dispatchers as they come into the railroad industry to be familiar with their territory. Are you saying that a video being used, is that one that is going to be acceptable as far as that being their road review? Is that something that is going to be just made as part of it? Or do they have go out and do the actual physical characteristics as the railroad is concerned?

MR. KEANE: That-- Not to brush you off, Jim. That is a collective bargaining agreement. What we're saying is a dispatcher should have physical characteristics. How those physical characteristics are performed is up to the union, or labor, and management to decide how they want to do it. What's the best way to do it. I mean, we're looking at logistics today. Just take your railroad, CSX, for them to go over-- For one individual to go over his territory, the railroad has a lot of elements that they've got to take care of before they can even send these people out into the physical characteristics.

They've got to line up taxicabs, line up lodging, it's an inordinate amount of money involved there. So my suggestion is if you want the actual physical characteristics, for a dispatcher to ride with a locomotive engineer, then that needs to be negotiated through some form of process that you have available to you. Does that answer your question?

MR. MCGILL: Well, in part, as far you're answering that part. But we are talking about people who have no knowledge of the railroad industry, other than to say that those that were given an HO gauge or N gauge or H gauge at childhood and that was something they learned to play with. A lot of the people-- In one of our conversations, I

think, we talked about that the people were not told the responsibilities which they were left with when they sit in the chair as working as a train dispatcher. I think that-- And this is my personal opinion when I say it in this manner. That for them to have road review and to know the actual physical characteristics they have to get out there and physically look at it. And if we're going to say that a video is acceptable, and we're talking about dollars and cents in this effort, they are putting a lot of investment as far as the individual being trained. Why not go to the full step and say that they have to go out there and spend some time in that territory so that when train crews, people in the mechanical department, people in the signal department, people in the engineering department, are telling them about certain things that have to be done in a particular area, they have some familiarization as far as what it is that they're dealing with.

And when I talk about that I'm talking about the elements, the terrain in which they're having to work, those are the aspects that I'm looking at from that aspect.

MR. KEANE: And, again, I have to go back and say that you need to sit down with the training people on your railroad and discuss how you want to do that. How do you want to accomplish what you want to accomplish. And right now we're saying-- We're not saying anything is good. FRA doesn't have any regulatory authority in this area right now. All we're doing is making suggestions to try and standardize the training for train dispatchers.

What we would like to see is dispatchers trained in similar ways. As far as physical characteristics, the word physical means to go out there and look at it. How do you do that is a way that has to be negotiated, in my opinion. I don't know how you're going to do that. I'll tell you what, this particular item, this particular subject that we're talking about right now, was a big item on our team. There was a lot of controversy in this area. We tabled this item three or four times during the meetings that we had and then at the final meeting they wanted to table it again. And I said no, we're going to

address it. We have to address it. And we need to. And the way we came up with it is-- These are just suggested, the ones I'm just suggesting. There may be other ways of doing this out there but at the time we were doing this endeavor, this was available to us. And the items I mentioned were videos, physical characteristics, track charts, some type of a computer that pops up and tells you what the territory looks like. In other words, you can get a view of it. There is some new technology coming out in the near future that will allow you to actually-- A visual aid to tell you which way the tracks are going, how the terrain is, and all of that. That's coming out in the future. I've seen some pictures of it. Some of our people have showed it to me and it looks pretty promising.

But, again, I'm not trying to brush you off but the thing is FRA can't tell the railroads how they conduct physical characteristics at this time. Okay, until there's a regulation out, that we sit down with the various groups that are involved and figure out a way to do it, then we'll have to just sit down and allow the people to talk themselves. In other words, you'll have to sit down and negotiate with the management on your particular railroad, okay.

MR. MCGILL: Thank you.

MR. KEANE: Anything else?

Q: Were you able to establish time limits for the various elements of the modules?

MR. KEANE: That was done by Research and Development, I believe. In Judy's presentation I believe you're going to get the answers to that. Anybody else?

MR. RASLEAR: Tom, can I clarify just one thing for the audience. Your email address, is there a period between your first name and your last name?

MR. KEANE: No, there is not.

MR. RASLEAR: Okay, different for me.

MR. KEANE: Yeah, make sure you put that FRA in there because there's a fellow in the Federal Highway that has the same exact name as mine. We swap email and mail all the time. When I first went to Washington-- He's an economist and I got the budget for 1999 or 1985 for the highway and I said damn, what has my boss got me doing now. Then I found out later we're not even related, he said. Any others?

MR. WYMAN: Mike Wyman with PTSI Transportation. Regarding your talk about the training of physical characteristics, our company is very much involved with that, along with IIT Research Institute. And I've passed around some literature but I think I've run out. If anyone did not get a packet on physical characteristics and they want one, just see me at the break.

MR. KEANE: Thank you, Mike. Anything else? Thank you.

(Applause)

## **Developing Objectives for a Train Dispatcher Training Program**

Judith Gertler, Manager, Human Factors, Foster-Miller, Inc.

MR. RASLEAR: Our second speaker is Judy Gertler. Judy is manager of the human factors program at Foster-Miller, where she's been involved with a number of railroad human factors issues. She led the dispatcher training study, which she will be discussing in her talk. She is currently involved in a separate study that is examining issues of workload, stress and fatigue in train dispatchers. And she has also been working on railroad worker safety issues in yard and terminals. Her background prior to joining Foster-Miller includes 14 years on the staff of the Volpe Center, where she worked on the early studies in support of the Northeast Corridor improvement program and conducted an institutional study of state programs for rail/highway grade crossing improvement.

Her talk is entitled “Developing Objectives for Dispatcher Training” and I think she may answer some of the questions that were raised in the previous talk. I give you Judy Gertler.

(Applause)

MS. GERTLER: Before I begin I want to introduce my co-researcher for this project, Stephen Reinech. Another person I’d like to introduce is George Kuehn, from IITRI, who I think probably came in late. There’s George. George also worked with us on this project and he was involved in developing the test designs.

Okay, I’ll begin my talk with a discussion of the reasons for the study, some of which I think have already been mentioned. I’ll talk about the scope of our work. Then I’ll summarize our approach for you. But the major portion of my talk will focus on how we developed the training objectives. I’ll say a little bit about how the training objectives are intended to be used in the development of a training program. And then I’ll conclude by sharing with you some factors that contribute to successful programs.

I know all of you are familiar with the two dispatcher safety audits because they’ve been mentioned several times already this morning. Both audits raise some concerns about dispatcher training. There were concerns about variability and how initial training was conducted. There was concern about a lack of consistent standards for determining competency upon completion of training. There were concerns about poorly structured on the job training and uneven practices regarding territory familiarization. After the first FRA report, FRA recommended that the railroad industry work cooperatively to address these issues and solve the problems on their own. When the follow up audit was done some of the same problems still remained.

Now we all know that concurrent with the time period of these two audits the railroad industry was undergoing changes in dispatching technology and we began to see

the influx of dispatcher candidates with no prior railroad experience. And all of this was on top of the mergers and consolidations going on in the industry. Following the second audit FRA took two actions. They set up the partnership that Tom Keane already talked about. And they also said that FRA would work to develop some minimum standards for initial dispatcher training and periodic refresher training. As Tom mentioned, his office undertook the project that I'm going to describe to you, to address the second objective.

Along with FRA we've developed the scope for this project. Because more and more dispatchers are entering the work force with no prior railroad experience we specifically wanted to target this group. The results of the work also had to be applicable to a wide range of railroads and dispatching environments. We had to make sure what we did was applicable to manual paper operations, as well as paperless computerized ones. In keeping with FRA's mandate to oversee railroad safety we focused on training related to maintaining safe and efficient operations.

We recognized that there are other non-safety job responsibilities that probably should be included in any dispatcher training program but that was outside the scope of what we looked at. We considered initial dispatcher training, initial territory training, and periodic refresher training.

The scope of the overall project included developing training objectives, model syllabi and test designs. But this morning I will focus primarily on developing training objectives. And as you'll see the objectives really drive the development of the syllabus and the test designs. Finally, I want to emphasize that what we set out to develop is a process for structuring and developing a training program to fit your environment. As I said earlier, there's no such thing as a one size fits all in this case.

Our overall approach involved two procedures: applying instructional design methods, and gathering information about the job of a train dispatcher and about current training programs. The information gathering had two parts. First, we used sort of a top

down approach, where we identified the primary job functions of a train dispatcher. The reason for this is that we wanted to have a framework or a structure, based on the dispatcher's job, that we could use in organizing the training objectives. The second part of the information gathering was a bottom up approach. We visited five railroads and I think at least three of them are represented here today. The railroads that we visited included two class ones, one regional railroad, one short line, and one passenger operation. Specifically, we visited CSX, Norfolk Southern, Springfield Terminal, which is part of Guilford Industries, the Providence and Worcester, and New Jersey Transit.

In addition we conducted a phone interview with SP and we reviewed the training materials for three additional railroads. So, basically, we had materials from nine programs. The goal of this bottom up approach was to identify some common themes that should be included in the objectives, as well as the subsequent test designs and the course syllabi.

All the information was used in the process of developing the training objectives, then the test designs, and finally model syllabi for each of the programs that I mentioned. In addition to the site visits we used a number of other resources: The famous 1974 Devoe Report, which is a comprehensive analysis of the job of a train dispatcher. This gave us a starting point for defining the dispatcher's job responsibilities. We also carefully reviewed the two FRA audits. We obtained training materials from the five sites that we visited, in addition to four additional railroads. We had a number of conversations with subject matter experts, including current and former train dispatchers. And, finally, we used the syllabus that Tom just described to you.

When we had draft materials available we circulated them to people in the industry for comment and review. Now we used an instructional design approach, as I mentioned, to developing these objectives. The approach gave us a framework as a process to use in developing the objectives. The framework assured us that the objectives

would be general enough to be applied in any railroad setting, yet useful since they're written from the student or the learner's perspective.

First we developed an overall course objective. We did this using information from the site visits and the available training materials. And then we used a structure provided by the dispatcher's job definition to actually set out and develop the training objectives. The training objectives have two components; there's an instructional objective and there's a performance objective. The instructional objectives are written from the learner's perspective. In other words, what should the student or the trainee be able to do upon completion of the training. Instructional objectives are somewhat top level. In a few minutes I'll give you some specific examples.

Now performance objectives, on the other hand, specify measurable or observable outcomes that the learner must accomplish. Achievement of the performance objective indicates that the instructional objective has been met. Why do instructional designers use these objectives? Well, first, they provide direction to both the students and the instructors on what specific knowledge and skills the student must learn and the level of proficiency that the student must demonstrate.

The training objectives are also the raw material for developing the training program. They guide the instructional designers in developing a course syllabus, which effectively organizes the objectives in a meaningful way for instruction. The objectives also aid the instructional designer in developing test designs to determine when the course objectives have been achieved. And then, finally, the use of objectives assures consistency of training from instructor to instructor and also across the different times that you give the same course.

Now I'd like to go back to our process for developing training objectives and provide the results of applying the process. The first thing that we did was to develop an overall course objective. Our overall course objective for initial dispatcher training is



upon completion of the course a trainee will demonstrate the ability to dispatch trains and other vehicles and equipment that travel on or along the rail safely and efficiently, and protect those individuals who work on or around the track.

The next step was to define the functions of a dispatcher. As I said before, this job breakdown was used to help us structure the objectives. After reviewing the Devoe Report and having discussions with many current and former train dispatchers, we divided the dispatcher's responsibilities into four categories. Planning involves anticipating the day's activities and preparing any necessary documentation. Controlling track use, as we all know, is the heart of the dispatcher's job. It involves initiating, stopping, monitoring, coordinating the movement of trains and other track users, as well as individuals who are working on or around the track.

Managing unplanned and emergency events consists of all those things that you didn't think were going to happen when you came to work in the morning and there are a lot of those. And then, finally, reporting and record keeping is required to document track usage.

Now we developed a set of 47 training objectives. The four categories corresponding to the four job responsibilities I just mentioned account for 32 objectives. Not surprisingly the controlling track use category has the largest number. Based on our discussions with railroad operating and training personnel we concluded that there are some general prerequisites to train dispatching and Tom mentioned some of those already. For individuals with no prior railroad experience the prerequisites include such things as familiarity with railroad terminology, which Tom mentioned, understanding the basic operational structure of a railroad, and being familiar with the different types of equipment that run on that property.

Other prerequisites, applicable to all dispatchers, include the obvious; knowing the railroad's safety rules and some more interpersonal skills, such as being able to

resolve differences when conflicting requests are made of the dispatcher. Then we decided we needed two additional categories, one for freight operations and one for electrified territories. Obviously, these wouldn't apply to all railroads. For example, Conrail would use the freight operations objectives but not electrified territories. But Long Island Railroad would use electrified territories. We think our list of objectives is fairly comprehensive but it's not intended to be all inclusive.

The unique operating characteristics of your railroad will determine whether or not you have to expand the list, change some things, or contract it in some way. For example, there may be some non-safety job responsibilities that you want to include in your training program. So, our list is intended as a starting point, either in your process of developing or reviewing and modifying your program. For an existing program I think the objectives can serve as a checklist in reviewing your course syllabus.

Now, after we developed our initial set of objectives we distributed them to 24 individuals for review. The 24 individuals represented 17 different organizations, including FRA, ATDD, a number of railroad personnel that we had met when we did the site visits, and some community college training officers. We asked the reviewers four specific questions. We said are there any additional objectives that are applicable to all railroads? Are there any errors in the descriptions of what a train dispatcher trainee should be able to do upon completion of the training? Are there any objectives that don't apply to your railroad? And, in general, we wanted any comments, suggestions, criticisms that people had to offer. And we got some very substantial, well thought out feedback, which we incorporated into the final set of objectives, which is in your notebook following my slides.

Okay, let me just give you a few examples of the instructional objectives that we developed. Under the general prerequisites we had "understand the terminology used in relation to the job of dispatching." I think we've already talked about the importance of

this one. In fact, one of the railroads that we visited had a glossary of railroad terms that were applicable to their particular operation and they gave out the glossary as part of the training program. It seemed like a very straight-forward approach and it seems to work.

Another one that we had in this category was “demonstrate clear and coherent communication skills and procedures.” Since the dispatcher spends so much of his or her day talking on the radio I think this is a very important objective. Okay, on controlling track use, let me just show you two of them. “Demonstrate the ability to correctly issue all forms of train movement and protective authority used within the limits of the territory being dispatched.” This is somewhat general in the sense that it doesn’t refer to a particular type of directive. We didn’t say Form D. What you would want to do with your railroad is say what types of authority you want to make sure your people know how to handle.

Another one that we had was “demonstrate the ability to plan for and arrange train meets in the most expeditious manner possible.” I think that’s pretty straightforward. Okay, “managing unplanned and emergency events”, it’s a difficult category since it’s hard to define all those unplanned events that can occur. So, we came up with some high level objectives in this category. “Understand the procedures to implement for an unplanned event or emergency.” You might want to change it so you would have one for dealing with haz-mat accidents, another one for dealing with a grade crossing failure. We also have “demonstrate the ability to implement a procedure and respond to a specific unplanned event.”

Then we have another one in this category. “Demonstrate the ability to compensate for lost capabilities when a computer or system outage occurs within the dispatching center.” This is particularly important in a highly computerized environment, where if there’s a computer failure or if there’s a flood that washes out the signals on the

track and you have to resort to a paper train sheet and a radio, the dispatcher needs to know how to handle that.

Now the final phase in this process was to develop the performance objectives. Remember I said that the performance objectives specify the level of proficiency that the trainees should be able to demonstrate at the conclusion of the training. Performance objectives have three components to them; the condition, when might the dispatcher have to demonstrate this performance. Then there is the specific performance, what exactly are they going to have to do. And then, finally, what's the standard for successful performance, how are you going to measure it.

Developing these was not easy for us. And I think if you try to do it in your program you'll spend a lot of time on it but it's worthwhile. Let me give you a sample here. Remember that a training objective has these two components; the instructional objective and the performance objective. Now this is an objective from our prerequisite category. "Understand the terminology used in relation to the job of train dispatching, including jargon and frequently applied shorthand terms in common use among the railroad's operating personnel." For this instructional objective the performance objective might be "given the need to communicate with another dispatcher, be able to match the following five terms with their meanings."

Now I'd just like to talk briefly about how the training objectives lead to a complete training program. We began with an overall course objective for initial dispatcher training and a similar objective can get developed for refresher or periodic training as well. Then we looked at the dispatcher's job functions to help us structure the objectives. Once the training objectives are developed it is possible to develop a syllabus and a test design. In our report we've developed a model syllabus, suitable for initial dispatcher training at a large computerized freight railroad. After we selected the objectives we grouped them based on informational similarity. Then we further

organized them to account for topics that required prerequisite knowledge of another objective.

The model test design that we developed for initial training is also driven by the objectives. An assessment of the importance of each objective helps you to determine the minimum number of test questions that should be included for each topic in a qualifying or final exam. Our report for this project will be available by the end of the month. The report contains a syllabus outline and a test design for initial dispatcher training, and that would follow from the objectives I've just been talking about. We also developed a checklist for initial territory training which, because it's an on-the-job training, it's really not possible to have a syllabus for that because the order in which you do things is determined by what happens each day. And we also have a suggested syllabus and test design for refresher or periodic training. Please see me or Tom Raslear if you'd like to get a copy of that when it's available.

When we conducted our site visits we had an opportunity to talk with individuals who were currently in training programs or who had recently completed training and were working their first trip. Based on experiences that these people shared with us and information that we got from railroad training officials, Stephen and I heard some common themes about factors that contribute to a successful program. I'd like to share just a few of these, I'll be brief because I know some of our other speakers are going to talk about them in more detail.

Development of non-technical skills should be part of initial training. Things such as time management, leadership, the ability to prioritize and lifestyle management. Both trainees and instructors agreed that integrating real world experiences into a training program is extremely useful. Having an experienced dispatcher come in and share situations that he or she had to deal with. Don't underestimate the importance of training for your instructors. A train-the-trainer program will ensure that your instructors have

adequate teaching skills. Also, individuals who do on the job training need some kind of guidance before they set out to qualify somebody.

Finally, it's important to continually evaluate your program. Trainers provide one perspective but dispatchers who have completed the program can also help with evaluation. I know CSX is attempting to contact trainees who have been through their program to get some feedback and to help them to improve the program. I think Roger is going to talk about that a little later.

Now in the coming years, as we have more changes in dispatching technology, program evaluation will take on increased importance. I'm going to have Steven answer all the questions. Comments, questions? Stephen, you're getting off easy. Okay, we'll move on.

(Applause)

## **The Effect of New Technology on the Dispatcher's Job**

Steven Ditmeyer, Director, Office of Research and Development, FRA

MR. RASLEAR. I don't know if you've all noticed the high tech device we have for making the blue screen go away. It's a sheet of paper. Our next speaker is Steve Ditmeyer. He's going to talk on the effect of new technology on the dispatcher's job. Steve is a graduate of MIT and Yale. He's been in the railroad business for 38 years, starting in the mechanical department of the St. Louis Terminal Railroad in 1960. Steve's railroading career is almost equally divided between the public and private sectors. In his early years at FRA he worked on the creation of Amtrak, the Northeast Corridor project, and the Staggers Act.

He had direct involvement in dispatching matters during his tenure as general manager of the Alaska Railroad. While at Burlington Northern he served simultaneously as Director of Research and Development and Chief Engineer, Signaling and

Telecommunications. He was initially involved in planning the new network operations control center and setting up its technical training center at Johnson Community College. Steve rejoined the FRA in 1995 as Director of the Office of Research and Development. I give you Steve Ditmeyer.

(Applause)

MR. DITMEYER. Thank you, Tom. It's delightful to be here with you all today. It's great to see old friends and it's wonderful to make some new contacts. Thank you all for coming. I'm going to talk to you about the effect of new technology, the potential effect that it has on the dispatcher's job.

I'm not talking about training but I'm talking about issues that you all have to bear in mind as you embark on establishing training programs. The new technology we most often talk about is positive train control. Some people imagine positive train control to be some kind of a secret proprietary system, it isn't. It's actually fairly simple. Digital data link communications between trains, wayside, and control centers. Digital communications between maintenance of way groups, wayside, and dispatching offices. Computers on board trains, on board maintenance of way equipment, and in the dispatching offices. Positioning systems, generally conceded to be global positioning system and DGPS receivers on board trains and maintenance of way equipment. So that positioning information gets automatically transmitted back to the dispatching offices.

That's basically what it is. Why are we considering it? Basically to improve railroad safety. The National Transportation Safety Board has had positive train control on its list of most wanted topics for a decade now. Accidents, train collisions, still continue to occur. What we're talking about is a system that can prevent or actually reduce the probability of collisions between trains, between trains and maintenance of way equipment, and reduce the probability of over-speed accidents.

Now, one thing that railroads, unions, and FRA all agree on is that the safety benefits, even though they're substantial and important, are not sufficient in and of themselves to justify positive train control. Positive train control also brings with it improved efficiency and productivity. It has the ability to shorten train running time, improve running time reliability, increase track capacity, asset utilization, and productivity. The heart of this is the ability of positive train control systems, and their various subsystems, to improve the quality and quantity of information in order to achieve these improvements. The focus is on reliable, accurate transfer of information between the computers and the people that together make up the train control system.

Now let's talk about current systems for a moment. With current voice radio there are problems. There's congestion on the communications channels that are available. The railroad industry has 91 VHF channels, six pairs of UHF channels. There's congestion; if you go to a dispatcher's office and stand behind them and look at his radio console you'll see quite often a queue of phone calls and communications awaiting him. I've seen a dozen or more calls that a dispatcher has to handle in sequence. Because of that the transfer of information is not timely. There's not the ability to stop the movement of the erroneous information and, quite frankly, train collisions occur because of communications mistakes. Two that have occurred in recent years, Ledger, Montana and Devine, Texas, were concluded to be communications mistakes.

At NTSB and FRA hearings dispatchers, train and maintenance of way crews, safety officials all acknowledge that poor communications has a major contributory effect toward accidents. In the late '80s the Federal Aviation Administration did a study of communications. Found that 23% of air traffic control errors were due to communications problems. And they found that there was this variety of problems with voice radio. And what occurs in aviation is the same in railroads, there's acoustic confusion. There's alphanumeric transposition. We all do it when talking to people;



somebody gives you a phone number and you write down the digits in the wrong sequence. With voice communications there's misinterpretation. Sometimes you'll be listening to a string, pieces of information flowing, and you don't remember what happens. That occurs to those of us who are at our age and stage in life more than some of you younger people. But the memory thing is real.

Channels, voice channels get blocked by keying mistakes. If keying the radio, if the key doesn't come up, the channel is blocked. Congestion is preventing the ability to clarify information. For railroad telecommunications the concept is that digital data communications would supplement but not totally replace the use of voice, of traditional voice radio for train control. The transmission media that are used in the railroad industry, VHF radio, the FCC has said that the railroad industry may keep their 91 channels but will cut them each in half, into smaller, narrow channels so that the railroad industry now has 182 VHF channels. UHF, as I mentioned the railroad industry has six pairs. They would like more, there's tremendous competition from a variety of other users to obtain additional UHF spectrum. It's going to be difficult.

Spread spectrum is of interest to some railroad people. It is unregulated. It's unlicensed and there is a potential for other users coming in and interfering with railroad uses. Some railroads, because of, again, limited voice channels are using cellular telephones. And, of course, satellite communications are possible. The fixed backbone parts of the telecom network are the microwave radio, fiber optics, buried copper cable, traditional wire lines, and leased circuits. Now, again, from the point of view of the dispatcher, the dispatcher doesn't care which of these media are used. The key thing is that there be a robust, solid telecom network to get the information from where it is to where it needs to be.

Also, what's interesting on this telecommunications media, there is a technological change going on. Again, one that won't affect the dispatcher. The older

telecom networks consist of analog technology. The move is to digital. But either one can carry either analog voice transmissions or data transmissions. But, again, there is an investment that the telecommunications departments are having to make to move to the digital technology, simply because it's better and more efficient.

Now digital data communications, how do they differ from voice? Digitally coded and the data is-- It can be either entered manually by keyboard or touch screen or by the computer itself. And the data is automatically checked for errors by the computer but, again, you don't want to have the computer make the sole decisions. It's, again, the data is there for both the computer and the human being to check for error-- For the existence of errors and hopefully therefore reduce the probability of errors being transmitted. The attractiveness of data communications is that you have the ability to display it on either cathode ray tubes, liquid crystal displays, and also to bring it out on printouts. The key element of digital data communications is that individual radio receivers are addressed discretely. You're no longer broadcasting and every radio hearing it. A message goes from the train to the dispatching office or from the dispatching office back to an individual train or maintenance of way crew. Selective transmission, very high transmission rates, and the general belief in the business is that the amount of communications that can be handled on digital channel is about twenty times greater than that which can be carried on a voice channel. So, again, it's very important with limited radio spectrum available to make better use of that spectrum and digital communications is the way to achieve that.

There is the issue, though, that you're eliminating the party line. And this is an issue that comes up both in aviation and railroads, train crews saying I want to hear what the dispatcher is telling other trains and so on. Others, though, say do you really want individual trains or maintenance of way crews making decisions on the basis of what they're hearing over the party line. Or do you want the dispatcher and the dispatcher's

computers to be the controller of that kind of decision making. That's an important one and it does affect how you go about implementing these systems.

With data communications you're able to relieve congestion, you're able to make better use of the limited radio spectrum. You're able, well it says here eliminate, no you're able to reduce the probability of errors significantly. Dependent on how many functions you put on to the digital data communications network that affects how much you download the loading on your voice channels. Not only train control and maintenance of way planning but also putting work orders, way side defect detecting, the talking hot box detectors, instead turn it into a data communication between that-- The hot box detector and the train and the dispatching office. Again, quite often-- We've all been in dispatching offices and a dispatcher talking to a train and the hot box detector coming on and stepping on it. Again, causing delays and complications.

Locomotive health reporting can also be moved on the data link, as well as motor power management in general. What happens is you get improved information transfer. The data link also provides the connection between the dispatching office and the switches for control of switches and also putting a way side interface unit, a monitor, on the manual switches. So that, again, the dispatching office knows the status even of manual switches, even though it cannot control them.

We'll see in a moment with some data that I have on following slides, when you switch from voice to data communications you actually can get by with significantly fewer messages. Because there's less interaction, there's less need for repetition, and so on. And because the data moves faster and more precisely and it appears on computer screens and so on, there's less time required for each communication session. The trains and maintenance of way crews don't have to initiate as many communications. There's more automatic communication that takes place. You don't have to rely on auxiliary media as much. You don't have to have fax machines for faxing track warrants at certain

locations, you don't have to have a separate cellular phone for certain communications. You don't have to have the old way side telephone boxes any more and so on. You can eliminate the need for the auxiliary media.

The key thing though, and it's worth repeating, data communications does not replace the need for voice. The need for a voice communication between dispatchers, train crews, maintenance of way crews is still needed. What's important for you all to consider in your training requirements, though, is that with this transition to data communications you're reducing the dispatcher's communications load, as you'll see in a moment. The dispatcher will spend less time communicating. Improve the dispatcher's communication efficiency, improve the precision. There will be less ambiguity in the information that flows, it will be more precise. And most important, you're radically changing the focus of the communications.

It's basically changing the paradigm. The dispatcher is going to be less of a person who gathers information and issues authorities and more of a person who has information for solving problems. There's less time spent in the data gathering aspect of the dispatcher's job.

Here's some data that I pulled out for a published Burlington Northern report. This was an analysis of a particular dispatcher on a particular day, randomly selected. It's neither a bad day nor a good day, nor a typical territory or an atypical territory. It's the Northern coal corridor, Fargo to Jamestown, North Dakota, ABS territory. What we saw during this two hour period during the day shift, during the morning, was the dispatcher spent 75% of his time communicating, 25% of his time thinking and doing other things. The analysis in this report said okay, how does it differ if data link is present. And you'll see here the numbers, that the dispatcher is engaged about 18% of the time in communicating, more of the time is available for doing the key elements of the dispatcher's job. Planning, safety, keeping the railroad flowing, and so on.

Now, again, this was a sample territory but in this two hour period there were 17 instances of communications conflicts. Say, a hot box detector coming on and stepping on a communication with the dispatcher and the train crew. There were 12 instances where the communications sort of broke down en route, in the middle of the session, and had to be reinstituted. Thirty-one times either the dispatcher or the train crew or the maintenance of way crew had to say “say again”, “repeat”, because it wasn’t clear what was said in the initial transmission. Twelve break downs and 34 pauses, as in the course of these communications where either the dispatcher or the train crew had to just simply think for a while before continuing on. But that took time away from the availability of that radio channel to be used for other communications.

So, again, a quick summary of what happens when one goes to data communications. Let’s focus maybe on the ones on the right. You’re reducing the dispatcher’s workload. You’re reducing the stress because, again, there are fewer communications in queue. The dispatcher has more time to operate. You’re getting better productivity, more timely information. And out of this, the belief is, that you get improved safety and service.

Okay, I’ve been talking about communication up until now but other technology is coming. And now we’re going to take a look at display technologies for dispatchers. Basically, the current CTC and dispatching systems, they’re technically different from the old CTC machines installed in the late ‘20s and early ‘30s. But philosophically they’re really quite unchanged. Instead of Grabbe relays there are microprocessors there that emulate the relays. Instead of having painted or etched plastic track diagrams on a panel, now a TV monitor provides the same display. And instead of toggle switches the dispatcher either has a keyboard or touch screen or mouse or track ball. But philosophically CTC is much the same.

What is interesting now is the new computers, the massive power of new computers permits some new and different kinds of displays to be generated. And hopefully give dispatchers better ability to see what's going on and to take actions. We've done some work, we in FRA have done some work with the MIT Media Lab and a group of graduate students there. And said think of new ways, given this great new computer power, on generating displays the dispatchers might use. But rather than having students work alone we've had the Amtrak's Boston dispatching office work closely with the students so that the students are developing ideas that may have some practical application.

We call this project Knowledge Display Interfaces, KDI. The Volpe Center, up in Cambridge, has been managing this project for us. We're now at a stage where we're prepared to show you a video here and we look for feedback on this. It is important, though, for you all to understand this is not-- What you see on this video are not things that FRA is advocating. We're not saying we think you ought to do it. Rather we're presenting it to you as concepts to cause you all to think and say no, that doesn't make sense or here's what we'd really like to have dispatchers see. What the Media Lab does, the software that they develop in the course of this project is public domain and it gets transferred, it can be transferred to any supplier of dispatching equipment and so on. So, there's no pride of authorship on our part or on their part but it is something that is available for people to use and work with. So, let's see the video now and then we'll--

VIDEO: Train dispatchers play a central and critical role in railroad operations. They're responsible for the safe and efficient movement of trains, as well as the protection of all track users. The dispatcher's job requires documentation, preliminary planning, monitoring and coordinating train movement, controlling train movement, responding to unplanned or unscheduled events, and last but not least dispatchers must

respond to emergencies. With new emerging technologies, through computer simulation, let's now visit the dispatching technology that may be available in the near future.

A dispatcher needs readily available and up to date information. Its delivery may be provided by a variety of innovative aids. Here is a screen with three sections; a track view, a world view, and a three dimensional string graph. The track view simulation acts foremost as a very powerful tool for the organization and retrieval of data within the railroad environment. It can display the myriad of elements pertinent to transportation management, including trains, track, cities, rivers, lakes, roads, switches, underpasses, and overpasses. Through pop up information windows data on any of these elements can be quickly accessed.

For instance, information on a train's destination, its cargo, and any restrictions that might apply to the train's operations such as slow orders. Progress relative to nearby landmarks, which may require special instructions, can also be observed. Similarly, switch information such as exact position, location, number and repair history can be acquired as needed. Additional information for emergency response may also be displayed.

If new traffic requirements must be added to the display it can be accomplished by bringing up an examiner/viewer menu. This menu contains an add a train option that provides the format to develop relevant information. After the add a train format is completed and a new train is displayed a path or route for the train can be planned by simply keying on switch points. The new route is shown here in green.

A similar function allows for the viewing of the train's planned route, shown here in blue. This feature is essential for considering possible scheduling conflicts with the add a train feature. Now let's examine the world view, which is a two dimensional representation of an entire track system and provides immediate information on the whole system. (end of tape)

... Used to dynamically change the display track territory to match the sliders area. Another feature of the world view slider is accordion zooming. The size of the slider can be changed by moving the left or right edges. This causes the amount of track territory to in the other views to change and represent that of the altered slider. The world view window is also the primary controller for the amount of dispatch territory displayed in the track view and a three dimensional string graph.

We now go to another level and present a 3D string graph, where the horizontal axis represents distance and the vertical access represents time. The bars represent the progress of three trains on parallel tracks. As we can see, the middle train is traveling from left to right and the upper train from right to left. The lowest train is also traveling from left to right. The slopes indicate the train's speed; the steeper the slope the slower the speed. The top two trains make a track change and crossover number one. The middle train makes the transition first. When it does, its bar color changes from yellow to green. Before reaching crossover number one the upper train changes tracks at crossover number two. This changes it bar color from yellow to green. When the upper train changes track it crossed over number one, which the middle train did earlier, the upper train's bar color changes back from green to yellow.

By rotating the graph we can see clearly the transitions of the top two trains through the crossovers. The bottom train is traveling at the highest speed and makes no track changes. The 3D string graph is an enhancing tool for local planning and scheduling of track occupancy and traffic flow.

Now let's look at another simulation called the digital Amtrak train model or DATUM. DATUM is designed to graphically represent scheduled train locations across the country. For this demonstration Amtrak is being used but a freight rail system can also be shown. The initial screen shows a map of the United States with Amtrak routes and major stations indicated. Assuming constant speed and extrapolating time and



distance parameters between stations, the expected train locations between stations are generated. The model, therefore, represents only timetable locations and not actual train location. Future implementations of DATUM will include both scheduled and actual locations of trains as real time tracking links are integrated into the model.

To start the model select the start time and day and the end time and day for which train movements are desired. For example, 5:30 pm Monday through 10:00 am Tuesday. Then view all the train movements nationwide or a localized section by zooming in on that part of the country. Please remember that this can also be applied to freight train system. This represents the Northeast Corridor. Because of the concentration of passenger traffic in this area some form of visual display of train locations may be very helpful for dispatch and scheduling personnel.

In this view we can see the Sunset Limited, labeled train number one, on its way from Florida to California and approaching New Orleans. The City of New Orleans, or train number 59, can be seen heading south from Chicago. When the Sunset Limited reaches New Orleans it waits for the City of New Orleans to arrive before continuing on to the West. The data for this scenario is taken from actual timetable schedules published in the Spring of 1997. Display devices such as this may be extremely valuable for combining train schedules for just this type of situation and, if data on actual train locations are available to dispatchers, potential problems can be readily assessed and transmitted to selected stations as necessary.

If we take the DATUM display with timetable information and integrate it with the 3D string diagram a more complex visual display is created, with the potential to be used as a planning tool. Here is a system view of all of the elements of train routes, schedules, time, locations, and distances where time is a single vertical line at a specific location. Applying this to our previous DATUM scenario we see the same trains

approaching and leaving the terminals over a 24 hour period. We can extend the period vertically to show weekly information, if the daily activity of trains is not reoccurring.

We have shown that the dispatcher's role is crucial for safe and efficient railroad operation. We have also shown that the future holds great potential for the development of display tools to aid the dispatcher in meeting the challenge of tomorrow's railroad environment.

MR. DITMEYER: Two days ago at home I got a copy of the new Smithsonian Magazine and there's an interesting article in it, that I commend to all of you, talking about air traffic control. But it makes the point that the air traffic controllers and the system flow controllers daily are playing a multi-dimensional chess game and that last planning screen that you saw there, indeed, is what you-- That's the best way for me to describe. It's a multi-dimensional chess game that the dispatchers, as the controllers of movement on the railroads, have to deal with.

Okay, summing up. We've talked about a number of new technologies that are likely going to be coming to railroads. And what do we hope to gain out of it for dispatchers? First of all, we want dispatchers to know where everything is in real time. Right now dispatchers, on half the territory of their railroads, don't know where everything is precisely in real time. The dark territory, the ABS territory, and even on CTC territory they only know where the trains are and maintenance of way crews are in a very lumpy sense, block occupancy. So we want dispatchers to know where everything is. And when you know where everything is then you can use the power of computers to start showing where things will be. You can start talking about displays for dispatchers that show where everything is going to be an hour from now, two hours from now, four hours from now. And the dispatcher then has that information to use for planning. For planning the operations.

Also, now the marketing departments, the transportation departments on the railroads, they also know where things need to be. They have scheduled requirements and so on. That information has to be made available to the dispatchers so the dispatchers can get trains, locomotives, cars, and crews from where they are and where they will be to where they need to be. And they need to do that efficiently and safely.

This technology that we talked about today has the ability to enable railroads to be scheduled, to talk about scheduled trains, locomotives, cars, and crews. It has the ability to enable dispatchers to keep all of these elements on schedule. When that's done it enables railroads to handle more business and to make more money.

I'll just conclude with a little story that I learned the other day. In the Department of Transportation we have a visioning process underway. We are trying to figure out where the transportation industry is going in the future. So a group of people involved in this had a meeting with trucking company executives. And they were anticipating talking to the trucking company executives about new technology as applied to trucks. They were anticipating discussions maybe on truck size and weights and on terminal requirements and things like that. As it turns out the trucking executives didn't want to talk about that at all. What they wanted to talk about was how upset they were at the poor performance of railroads and how that was limiting their ability to handle the goods.

They said railroad service is not adequate, we would put a lot more trucks on the railroad network if only railroad service were better. They had some rather draconian ideas on ways that they would go about changing the railroads, and I won't go into that. But it was fascinating. In this country now there's a transportation crisis. Railroads are a key part of it and they are key, they have to handle more freight. They have to handle more passengers. And they have to do it efficiently and safely. And that's the challenge of this new technology, that's the challenge that you all face in carrying out your training programs for dispatchers. Any questions?

MR. MCGILL: In a few minutes you're going to take glue and put it in my seat or ask me don't you have another question that you could ask yourself. I've looked at the presentation and the Director of Research and all of that looks very good. As things that can happen for us in the future and what we have to look forward to. The demanding-- And you talked about the truck lines and that type of business. In your research have you given any consideration as far as the physical impact and what this new technology is going to have on the train dispatchers. As far as them having to deal with these things that are going to happen four hours down the line and them making these decisions. You talked about the many circuitry which they will have to deal with and all of that decision making. Has there been any consideration given as far as the physical and emotional effect that it will have on them?

MR. DITMEYER: What we know is that it will have an effect. We have not done the research to analyze that. I would basically say that that's on our list of things to do.

MR. MCGILL: Thank you.

Q: Steve, you've said that the two ...(inaudible) test you gave on the Burlington Northern had reduced communications from train and MW crews. Now how do you reduce their communications? They still are going to have a means to communicate with you and what's to prevent them using the digital just as often as they did the voice?

MR. DITMEYER. What happens there, Bill, is that with the data link there's more, how shall we say, automatic communications. There's more automatic communication from the train to the dispatching office on its progress over the route, on its speed, and so on. Similarly, there's continuous confirmation from the maintenance of way crew to the dispatcher that they're still on the track, it's visible whether they're on or off the track. The maintenance of way crew has the ability, over the data link, to automatically call in not to the dispatcher per se but to the computer initially to determine

windows, track and time windows. And it can analyze-- The maintenance of way crew can analyze then which window they would like and once they select one, only then do they communicate to the dispatcher and request that particular window for authority to occupy the track. So, in that sense, there's less negotiating between maintenance of way crews and dispatchers for track occupancy. There's less inquiry from the dispatcher to the train on where are you and what are you doing. That information is automatically there presented to the dispatcher.

Q: The other question I had was that the analog over digital-- The analog has had some benefits for dispatchers because before crews never knew why, for example, they were put into a siding while another freight went by because it was on short time or something like that. And you constantly had dissatisfied train crews, some of whom at the end of their run would get in and call and blast the dispatcher on the phone. But this would give them a greater understanding of it and it's given them, you might even say, some rapport that they never had before. And the digital-- Although I think it benefits over-- Exceed the benefits of the analog but that will take that away. Is there any way that you have looked at that type of enhanced communication between them can be kept while you still have the benefit of digital?

MR. DITMEYER: One of the issues that has to be dealt with in implementing these kind of systems is, again, how much information the railroad desires to give to the train crew. There would be nothing inhibiting the railroad from giving more information to the crew, to give the crew a window on what's happening around it so that it understands it. But that is an issue designed with architecting the system.

Hopefully-- Maybe my colleague this afternoon from the Federal Aviation Administration may touch on some of these similar issues that the air traffic controllers face. There's-- The debate on that kind of issue is virtually the same if I might say. So, again, I think it's break time. A question?

MR. RASLEAR: Steve, one other thing that I thought you might want to mention is what we're doing with weather. Being able to let the train crews know maybe of problems with washouts and things like that.

MR. DITMEYER: Yes. One of the intentions is-- Let me start over. Weather is obviously a key issue for railroads and getting weather information to the people that need to know it is a key issue. So, it's both the weather information and moving it to the people that need to know it. And that is an issue that we plan to address in a workshop next Spring, we haven't set a date for it yet. But this information coming into the dispatching offices again is information that can be put in a digital format, sent out to train crews. The instructions for slow-- Because of weather information the dispatcher can see possible flash flooding in certain areas, automatically issue slow orders right now to the crews, and so on. This, again, is one of the whole information transfer issues that digital data links, positive train control can make possible. Last question?

Q: I just thought I'd add a little commentary, especially to the gentleman over here that asked the question about how the new knowledge display kind of interface might affect the dispatcher in terms of their physical and emotional aspects. I was involved in that project and I can tell you that one of the goals is really to reduce the dispatcher's workload by understanding a little bit more in depth of how the dispatcher processes information. And the difficulty is on two levels; one is really teasing out and Steve had a really good analogy in terms of thinking for the dispatcher's decision making processes is like playing chess. And what the dispatcher is really doing, in my mind, is really in very complex visualization process, that takes years and years of experience to accumulate that knowledge database in their head and then to operate in those kinds of decision making capabilities. So one of the tasks is to try and tease out how they visualize that information so that you can represent those visualization patterns in new kinds of displays that, on the one hand, will take an expert dispatcher and give them more

efficient ways of processing that information out in their environment. And also take novice dispatchers and bring them up to a level of expertise that previously would take them years to accumulate.

So those are some of the goals. The difficulty is in trying to understand the level of complexity in how the dispatchers think and process information. And that's why it's important to get feedback from people about whether this is going in the right direction, what other kinds of information which is utilized. And then the task is to actually design it into an interface that you can accomplish that.

So, I mean, that's how I view it anyway.

MR. DITMEYER: Thank you. A question was asked of me earlier, whether the video was available. The answer is it will be. We don't have extra copies right at the moment but we will be making multiple copies if people are interested in it, either leave a copy with me or any of the other FRA staff or the Foster-Miller staff and we'll do our best to make sure that you get one in a timely fashion. Thank you very much.

(Applause)

## **Training for a Passenger Operation**

Robert McDermott, Superintendent, Train Movement, LIRR

MR. RASLEAR: As we wait for people to settle in. Our next speaker is Bob McDermott from the Long Island Railroad. Bob has worked for the LIRR for 24 years, starting off as a tower man in 1974. In fact, he participated in the first classroom based training for LIRR tower controllers. In 1976 he was promoted to train dispatcher where he participated in the first classroom based training for LIRR train dispatchers. From 1976 to 1983 Bob worked as a train dispatcher, assistant chief train dispatcher, and chief train dispatcher. In 1989 he became transportation manager and in 1990 he was appointed superintendent of train movement. Bob is a member of the LIRR operating

rules committee, as well as of FRA's RSAC committee on railroad communications. His talk is "Training For A Passenger Operation". Bob McDermott.

(Applause)

MR. McDERMOTT: Good morning. Someone suggested during the break that I make this like a true train dispatcher and get back on schedule. And then they said you know we do that, we cancel a train. I didn't know whether they meant to cancel my talk or not. So, I'll try and get us back on schedule. I just want to make a quick commercial announcement here. When I was asked to do this I had never heard of a group of train dispatchers getting together and looking at the craft like this. And certainly hats off to the FRA for engineering this idea and Judith Gertler and the other people involved in it. I think it's real refreshing and it's certainly impressive to see this many people. I'm sure no one held a gun to each of our heads to come down here. So, it's really nice to see this many people interested in the craft.

I was asked to talk about training for passenger operations and how we do it on the Long Island Railroad. And in doing that we just came up with a few bullet points that I would like to talk about on how we do it on our property. And then go through and get some ideas. We heard a wealth of ideas this morning on how we operate and we heard some nice presentations, and I'm really interested in. We'll let you know how we do it.

First of all I wanted to give you a little Long Island Railroad overview. We'll talk about the recruitment, hiring and training of train dispatcher. We'll talk about what is a train dispatcher. Some people here might not know clearly, exactly what we do. We'll talk about training today and we'll also talk a little about training for the future. The Long Island Railroad, we like to call ourselves the largest, busiest commuter railroad in the world. I always say "we like to say that", I always figure somewhere along the line someone is going to come up someday and say "ah-ha, you're not". But for the time being we like to call ourselves that. We serve 265,000 passengers on an average week



day, on 740 trains. In 1997 it amounted to 75.8 million rides. We have eleven branches going out of Long Island, ranging from Penn Station to Montauk; 124 stations, 1120 cars and 701 track miles. In 1997 our annual operating budget was \$846 million, with approximately 6000 employees.

I wanted to begin with a question, do you recognize these people. Well, the picture is kind of cloudy. It was actually taken in January of this year in Penn Station. It was the corridor, if you're familiar with the area, it runs between the 7th Avenue subway and the 8th Avenue subway in Manhattan. The answer we're really looking for is these are US rail passengers, something we're all familiar with. Millions of people each week travel by rail in the United States, the majority of which are daily commuters.

Now to put that all in perspective, the average rush hour commuter train carries more passengers than a 747. Most of us flew in here today, we can visualize what an airplane holds. Most trains carry more than that, more than a 747, and in some cases more than two 747s. We have trains on Long Island which-- I don't want to talk about standees but we do pack them in. We carry up 1500, 1600 people on one commuter train. They're a diverse group, they come in all shapes, sizes, ages, ethnic backgrounds. And yet all of them have one thing in common, all the rail passengers, the movement of their train was directed by a train dispatcher. You begin to get an idea of the responsibility that these people have.

What is a train dispatcher? They're the people who make sure your train is on the right track, literally. And issues train orders, yes we still issue train orders on the Long Island. I was on the RSAC committee down in Washington and one of the committee members looked down the row at me and just out in the open said to the whole group "Well the Long Island, for crying out loud, still issues train orders." And I felt like a dinosaur. Well, it's not that we don't like Form Ds or any other movement from it, we

just have not evolved into that stage yet. And yeah, we still use train orders but we found out that they're a tried and true tool and they work very well.

We have three branches where we still have some clearance cards, all done by a train dispatcher. And on and on. The train dispatcher issues mandatory directives, speed restrictions, track outages. We go down the highway, we see the highway department closing roads to do maintenance on it. We do the same thing on railroads. We have to fix them, we have to maintain them. Who arranges for the track out of service, the train dispatcher. Amongst all the train movements and everything else he has going on at that time. Ultimately, what is a train dispatcher? They are the people who provide for the safe and efficient movement of all trains on all tracks and sidings. A big, big responsibility.

We talk about hiring train dispatchers. Where do they come from? Fortunately on Long Island, and I'm certain we have a vested interest and thoughts from other railroads, but on Long Island we still have certain control towers. We have about 14 of them left, down from twenty something a few years ago. We are consolidating towards a central control but we're not there yet. So we are still able to draw from the towers. I certainly sympathize with those roads that can't and I'm certainly interested to hear how we're going to overcome that problem when we don't have a group of people to draw from.

We still have the problem, like you do, of how we get someone, from filling out a job application and handing in a resume, going through an interview process, successfully completing the interview and getting hired, and ultimately to here, becoming a train dispatcher. The answer, of course, is we train them. They don't come off the street as train dispatchers. It's up to us, collectively, to train them.

How do we do that? In 1976 the Long Island Railroad started its first classroom based train dispatchers class, which I happened to be a participant of. So, I'm well

versed in it. We were chosen from the existing control tower personnel. It was the first time they had tried something like this and we've continued on that now for the past 22 years. The instruction consisted of a combination of classroom and field work and we continue that today. The training duration is about four months long. The dispatcher class ranges somewhere from about three to four people. It's conducted in-house, by Long Island Railroad operations qualified instructors; former conductors, locomotive engineers, tower persons, dispatchers. We have a strong emphasis on operating rules. Obviously, we need that in this business. We've all heard that, I'm sure we all understand that.

We have an equally strong emphasis on physical characteristics. We are somewhat fortunate than some of the other roads that are here in that we can physically take an individual, a trainee, and have them ride the whole island. We can take an instructor, with a group of trainees, and go from Penn Station all the way out to Montauk and we insure that everyone in the class has seen the area they're going to dispatch.

In addition we want to go a little beyond the rules and characteristics. We train them in air brake and equipment training. We train them on troubleshooting disabled trains. We talked about running 740 trains a day, broken down between 6:00 a.m. and 10:00 a.m. on any given weekday. We run about 90 trains into Penn Station, which is shared by Amtrak and New Jersey Transit. We take about 60 trains out, that's 150 Long Island train movements in and out of Penn Station. If we have someone break down, it hurts us big time. We run into things called passenger tolerance, when a train behind the train, as well as the train the people are on that broke down, people want to kick out windows and we've had it happen. We try and train our dispatchers in troubleshooting trains. We don't want them to fix the train, we want them to be able to tell the crew what to do to get going. I lost a door light, I can't draw power, I can't move, I can't get the brakes off. We want them to be able to say how do you do this. We've done it, it works

well. We don't solve every problem and we have to fall back to MRV at times but we have dispatchers who can now troubleshoot trains.

Signal training; we don't want them, again, to go out and fix the tracks but yeah, we'd like to know what an impedance bond is, would like to know what an insulated joint is. When the track department or a signalman calls up and tells the dispatcher I have to change an IJ at this milepost. We'd rather the dispatcher understand what he's talking about, have an idea how long it takes, than saying okay.

The assessment: we get to the end of this four month course, what do want a train dispatcher trainee to be able to tell us? We want them to tell us the rules in effect on all branches. Is it dark territory, is it automatical territory, is there a cab signal, is there no cab signal. As well as the little intricacies that go along with that. Special instructions; can I back up in this area. Can I clear the main track if a switch is not equipped with electric lock. All these things, these rules in effect, the dispatcher has to be able to list before he continues on.

We want them to know the names and locations of all interlockings. The Long Island currently has 46 interlockings outside of Penn Station. That's a lot of interlockings. Some are two track interlockings, some are eight track wide interlockings. Some have four signals, some have 30 signals. We want them to know the location of all interlockings. In addition, we want them to know every interlocking signal. It sounds like a lot but we believe it leads up to a better dispatcher. If you're familiar with Long Island somewhere in the middle of Nassau County is a town called Mineola. We have a two track main line running through the village of Mineola at grade level. We just had one crossing elevated but for the most part it's at grade level. With an intersecting branch to what we call the Oyster Bay branch. Nassau interlocking has 32 signals in it. We want a dispatcher to be able to tell us, before he works, where those signals are, how many signals I'll get going through the interlocking, east, west, whatever direction you're

going. In addition to that we want them to be able to tell us every interlocking route. Can I get to this track, can I get to that track. If you've ever been on the Long Island Railroad and gone through Jamaica you'll find out that we say the world passes through Jamaica. We have ten main tracks going through Jamaica. If you're coming in to Jamaica on the Atlantic branch we want a dispatcher trainee to be able to tell us let's see, from two Atlantic I can get to tracks four through nine. We don't want them relying on maps, overheads or guess work. We want them to know that.

That's not to say you can't take out a map down the line and look at it and verify what you're talking about. We don't hold them to that when they're working. But in order to be assured that they have a real good idea of what they're doing, we want them to be able to tell us that on a test. We want them to name all the stations in order, right as we have them printed in our timetable. You tell us the stations. The location of all platforms, is it a high platform, is it a low platform. Is it north of the tracks, is it south of the tracks. Is it an island platform. In addition to that we want to know the location of all third rail. Not substations and cut sections but where does the third rail begin on our branch, where does it end. Is the branch electrified, is it partially electrified.

Now, what happens at the end of the training. We test them. The training culminates with a two-day written and verbal exam. One day on the operations, the operating rules; the next day on physical characteristics. Seventy-five question written test, half a day written, half a day oral. The exam consists of, obviously, all the operating rules and physical characteristics, issuing train orders, clearance cards, different situations they have to work their way out of in essay form. And, of course, it's administered by the rules examiner, independent of us in the operations center, independent of the training department.

The rules examiner has no involvement with them until they sit down and they administer the test to them. Now what is the passing mark for this test. We're not alone

when we say this because I know there are other roads that do it, we tell them the passing mark is 90%. We give them three shots to pass. If you fail the first time we'll let you take it again. Fail a second time, get ready, one more chance. If you fail the third time, we'll see you. We put that much emphasis on the training. We can't afford to have people up there who don't know what they're doing. It's a dangerous job, we want them to look at it as such.

Training for the future, where do we go from here. We've started what we call pre-employment testing. Now our human resource department gives tests to people who are coming on as tower men. We have a great interest in that because, for the moment, this is where our future dispatchers are coming from. What kind of test do they give them? Aptitude tests, that type of stuff. Judith talked earlier about unplanned emergencies and things that happen. We try and get a sense that we are hiring people that will be able to handle not just writing numbers and moving lights but the unplanned emergencies as well.

Not quite five years ago, it was December 7, 1993, at 6:12 in the p.m., it was dark with the night, we had what we called the unthinkable happen on the Long Island Railroad. When a young man named Colin Ferguson go berserk on a commuter train with a gun. He shot 25 passengers, killing six of them. I had the great misfortune of being there about ten minutes after it happened and it's one of those photos that is locked in your mind for all time and eternity. Horrific sight, worse than any fatality I've seen. How do we prepare a dispatcher for that? I don't know. But the best shot we can do is hopefully get someone that can develop a test that says this person might be able to handle that. We'll never know for sure. Our general superintendant that night was visibly shaken. Who can handle it, who can't. But we want to try and make that effort so they can handle these unplanned emergencies, hopefully not that dire but certainly fatalities and collisions, derailments, when they happen they can handle it.

In addition, we are trying to get a sense for whether they can handle railroad operations and grasp at least the concept. So what we've done with our potential applicants now is we bring them in on a Saturday, 10, 15 whatever it is. We give them a couple of pages out of the book of rules. This is done by human resources in concert with the transportation department. They'll give them definitions, they give them signals. They give them three weeks to study them. You come back, you take a test, and you must pass the test on the signals and definitions. If you can't tell us what a stop signal is or you can't tell us what the definition of a block is, we're not sure we want to go any further. We want to at least have someone that, hopefully, grasps the concept.

We get them into training, what do we do? We continue our emphasis on operating rules and physical characteristics, as well as all the situational things that come along with it; unplanned emergencies and all the other stuff you'd work into that. I'm not going to go into it now. In addition, as we head down the road we're going to use a simulator, like a lot of railroads have already used. Dispatchers will actually operate through a rush hour. Not just an average rush hour, we're of course going to throw some curves in there and let them work their way out of it in real time. They're not screwing up the rush hour but they're learning to work under that environment.

That being said, and I'm trying to get us back on track, I think collectively as we all round the bend here into 1999 and we start the run for the 21st century, we have to look at the changing technology and how we get that knowledge across to our dispatchers. We looked at advanced train control, digital communications we've heard about, crossing predictors, global positioning satellites, communication based train control, and who knows what else is coming down the pike. We, collectively, as train dispatcher trainers have got to take that information, get it to the people who are doing the job, so they can ultimately run efficiently and above all safely. Thank you. Any questions? Great. Thank you very much.

(Applause)

## **Considerations in Merging Two Training Programs**

Patricia Doll, Manager of Central Train Dispatch, Union Pacific Railroad

MR. RASLEAR: Well thank you, Bob. You have indeed put us back on schedule, I believe. We're now going to hear from Pat Doll, from the Union Pacific Railroad. Pat began her railroad career as a clerk for the Southern Pacific Railroad in 1973. She was promoted to control operator, where she worked for several years before becoming a dispatcher in 1984. One consolidation and two mergers later she was awarded a position with the Union Pacific Railroad as Manager of Train Dispatchers. Pat has had a steady involvement in the development of training programs covering all facets of train dispatching, including rules, computer-aided dispatching systems and mainframe use. Her focus at the UP has been specifically to train both apprentice and experienced train dispatchers in the use of the former Southern Pacific computer-aided dispatching system and to continue developing a quality dispatcher training program.

The title of her talk is "Considerations in Merging Two Training Operations", a topic which I think has great interest these days. I give you Pat Doll.

(Applause)

MS. DOLL: Well, this is going to be a first time presentation for me and I don't do videos and overhead displays. Everybody I asked about it said that you're going to get in trouble, something will fall on the floor, or become unplugged, or whatever. So I brought props, the first one is going to be my clock so I try to stay on time. And I've got a little spoon and I've got a newspaper and I've got a 1959 edition of the rule book, which we haven't seen in a long time. Somewhere around here there's a quarter too, there's a quarter down here.



I was also given some advice about how to keep from being nervous standing up amid-- They told me I was supposed to visualize everybody out there in their underwear. Well, I tried that last night at the reception and I didn't sleep last night. So, I think today is going to be okay. I spent last night with all of you in your underwear and I don't think anything bad can happen today after that.

I really want to thank Judy, Steven, Susan Madigan for including me in this. For accepting my input into the program about what the training program should be for train dispatchers. And I really want to thank Tom and Mr. Keane both for their input on the FRA in sponsoring the workshop. I think anything we're doing involving the training of train dispatchers, there's only got to be good coming out of it.

I neglected to put in my write up for Tom that I was a training manager for the Southern Pacific for four years before I came over to the UP. It probably doesn't sound like very long, four years, to gain any expertise in training but David Voltz, sitting over here, will tell you if you spend a short time with a train dispatcher it's like a long time, wouldn't you? Okay. So, I did get a good hard schooling on what I needed to try to help out with the training program around the Union Pacific. The second thing I want to clarify is that the merging of the two training departments on the Southern Pacific and the Union Pacific, I had very little to do with it. It happened at a much higher corporate level than me. So, I'm only going to speak about what I know about it from my end and that is just as surviving that merging, okay.

The very topic of training departments really requires some explanation, it needs clarification. You're not going to be able to pick up the phone book for the railroads on very many sites and find a listing that says training department, train dispatchers. You see training department but it's usually associated with the human resources department. Training an engineer, conductor, everybody is figured in that. The same thing in the budgeting costs. Train dispatching is usually just considered as an extension outside of

the train dispatching office. They pull train dispatchers to be trainers, they use them back and forth maybe as working dispatchers. You're going to have a hard time when you go to do a merger if you're trying to combine two training departments and you can't find the training department. Corporate is probably going to look at, when they start talking about a merger, just the costs. They're going to look at the hardware. They're going to look at the cost of the software, they're going to look at the costs of the train control systems, they're going to look at the number of dispatchers, they're going to look at what they thing they're going to need. They're going to look at how many instructors they have. Their bottom line is going to be dollars. Their first decisions are probably going to be involved in what they're going to need for before the merger, during the merger, after the merger. Training costs for that. What kind of equipment they're going to need if they can combine them. If they can keep them separate, stand by side, or maybe just get rid of all of them and have a new system come in later to replace both of them. If you're trying to follow my outline you're probably having a problem because I'm going to cut a lot of material out of this to try to keep on time.

I am also going to tell you that I am not here to tell you how well Union Pacific/Southern Pacific did on merging their two training departments. If anybody wants a report card about how the Union Pacific did you just go out and spend a quarter and buy a newspaper because we've been in the headlines for the last year. And you'll find out what we've been doing or not been doing by reading the paper.

Okay and I brought some of these too, old train orders. Alright, I'm sure the reason they included this topic today is because there are still mergers being contemplated or plotted out there. Even if you consolidate an existing road, one road, and you take all the branch offices and you bring them into one, the issues that we faced are still going to be pertinent also. Any time you bring the training programs or different training instructors or different training programs-- I'm repeating myself. Program to

program, any time you bring them together you're going to have issues, you're going to have problems that are going to come up.

Everyone here today is involved somehow with train dispatchers and that's just makes me happy to see everybody here. We've all got interests; FRA wants to standardize training, I thought they did until I talked to Tom last night. And Foster-Miller has been developing the process. The individual roads, I guess, are here today to see where that process is going or if there's going to be one. And if we have individual train dispatchers here today they'd probably be interested in the program too because they're very much interested in what their training is and where it's going. Or if they're going to get any at all. Management is not in a position that they want to be reacting to anything that's happening with a merger. That's probably another lesson that was learned from the Union Pacific, which you should tell us thank you for. We all want to be proactive. We want to think things out ahead of time, we want to plan for everything. We want to take everything into consideration that we can possibly think of. Hopefully today I'll tell you one thing that you may think of, that may help you out.

Reacting when you're in a merger, the first thing you're probably going to be reacting to is a loss of dispatchers. You're going to have people that are going to take early buy outs, they're going to retire. They don't want to move to Omaha. They don't want to live in the Midwest where all the corn and beef is. They eat it, they just don't want to live in the middle of the field with it. You're going to have to react immediately to how you're going to replace them. How are you going to hire people, how are you going to get them trained. You're going to react to the loss of training staff, they don't want to live there either. You're going to have to get a true department picture of what your needs are going to be to get these people trained to take care of the losses that you have. You're going to have to take a studied approach towards both sides, both railroads, both offices of the consolidation to see what you're going to have to do.

To do that you're going to have to acknowledge that there is a training department separate and apart from other training departments on the railroad. You're going to have to see it as a tangible asset. If a training department is merely that extension only necessary for seasonal training or recertification, then you're not going to be able to measure it as a tangible asset. There was a recent study conducted, and they may have used UP for the study, I don't know, that said that the hard assets of the company, like their land, their buildings and their equipment, accounted for only about one-third to one-half of a company's stock market value. The studies confirmed that the real assets of a company--(end of tape)

The trainers that train those train dispatchers. You have to measure that in costs if you're going to start looking at what you're doing to merge any two companies you want to start putting together effective timelines and cost studies. You need to come up with some measurement of what that's worth to you before you just not value its worth and let it go.

There was a cross study done to try and measure in dollar worth what a person's intellect was worth. George Mason University and the Accounting Standards Board, the Financial Accounting Standards Board, formed a committee to try and measure what the cost was. They used just the body chemicals that are found in the human body, the 1979 Biomedical Catalogue came up with a cost that-- They figured \$36,000 per pound. That if an average employee weighed 150 pounds, every one of those employees was worth \$5,400,000. There sits my boss, Joe Fortner, back there and I thought I'd take this opportunity to point that out the next time I come asking for a raise. Especially in my weight category range.

Alright, once you've taken and made this decision, that a studied approach is going to occur, you're going to have to take an assessment of the needs of the training departments. What are their needs, what do they need to get you through the merger or

the consolidation. It's got to be more than the hardware, it's got to be more than the train dispatching system, it's got to be more than the mainframes and the PCS and the software. It's got to be those people and those headcounts and those soft assets. You've got to take it all into accounting.

If you don't you're going to end up without a clear picture of what's going to have to happen. Prior to the move from the Denver office where the SP dispatchers-- SP sent me up to Omaha to study the Union Pacific office. I spent five days up there. I had a list when I left, a short checklist. It was basically around the rules because I taught operating rules and I did do the Digicon computer system on the side. On that list I didn't have very much on it. Then I started talking to Susan Madigan and Stephen Reinach and Judy, I think, called once or twice and we talked. And they were starting to point out all the differences that they found in all the training departments, in all the different railroads. And I thought whoa, if they're that different maybe I ought to change the checklist. Because I had tunnel vision. All I'd ever worked for was one road.

So, I went back to my list and I added a lot of the questions they'd been asking me about this safety rules, the air brake rules, and how those affected the train dispatchers. I added high wides, how they handled their high wides. I had no idea anybody else handled them differently than we did. Hazardous materials, I thought that was standardized and I found out it wasn't. So I started asking questions about that.

Those five days in Omaha, with the Union Pacific dispatchers, at that time was five of the hardest five I've ever spent. I sat with them every day, all day long, watching every move they made, every process, every key stroke on the keyboards, everything they said on the radios. I couldn't figure out why radio procedures were different, they were. I went home, went back to the hotel at night, I opened up their rule books, their safety rules, their air brakes, everything they did. I did a word for word comparison, back and

forth. Went back to Denver with 64 pages of material and they were all differences, typewritten, single spaced. Sixty-four pages of differences between the two properties.

A lot of them were only indirect to the train dispatching office. They were air brake rules but indirectly that affects the train dispatchers and how they handle their trains. So, I needed to know why trains were being handled differently there and then on our property. Like, for instance, they have DPU, distributed power units, we didn't have any such thing. We were using helpers. In fact, most of the UP dispatchers that I talk to, even today, if I say "helper" it goes right over their head. They talk DPU. And that's a great and wonderful thing but we didn't have it. So, we had some major training issues there that we were going to have to cover.

I really was overwhelmed by the amount of information that I took back. I think the people I took it back to were too because I never heard about it again. I just handed them the books and that was their issue then. They were going to take care of it. I had no idea how different we were on rules. The general code application is the general code application. And they had GCOR, we had GCOR. But we turned off rules and turned on new rules and they did the same thing. They turned off rules and turned on rules.

Then you take, in conjunction with that, you say how is that dispatcher supposed to apply those rules. So that's markedly different. Every railroad is going to come up with their own interpretation of how they want their dispatchers to apply those rules and still stay in compliance with the FRA standards and the CFR 49. So, we had a huge undertaking to try and compare and put together those rule books.

Everything we did was hinged upon one thing, the train control systems. Were we going to keep the two train control systems or separate them or buy a new set up or what. Everything, every decision we were trying to make, every timeline that we were trying to drive on the SP side was going to be based on that. I see you flipping pages,

you're lost, because I'm way off in never-never land right now. I tell you, I'm trying to keep you on time and I'm really ad libbing here.

The train control system drove all of our decisions. We had to do the comparison on rules though, we had to get that in place right away. We had to find a place where we could get everybody on the same page on rules. That was probably the hardest part that we came to. Months ahead of any of the physical moves and the assessment processes were done, and everybody knew what was going on, we kept getting driven by time. Oops, use one of my props, by time. We were supposed to stay on time to get everything done before the merger. We had a list of those, you separate them out, what do I need to do before the merger. What are the things that you're going to have to do during the merger to bring the two properties together. And what are you going to have to do after the merger, the things that you set aside and you didn't have time to take care of. What are you going to do with those. How are you going to prioritize those. And besides which, after the merger, you're going to have a whole lot of new issues to take care of because after the merger and all those people didn't want to move to the middle of the corn fields, you're going to have to take your whole program and revamp it. And now your only issue is you're worried about getting warm bodies in the chair. People that can get into the chair and start filling the empty seats.

You've got a six months training program, you're not going to have anybody in the chair for six months. So that was probably our major issue. If you don't get your timelines in place and start planning for the before, during, and after you're going to end up with-- Your entire training staff will be consumed with the need just to fill the empty seats. We had initial plans in place for merging the two offices and then when they finally made the decision about which train control system we were going to use then we went ahead and changed those and altered it. We ended up with two train control systems, two training staffs, two train sets of applications of the G-core, two different

perspectives, two philosophies, that's a given that's going to come together in any two merging of anything.

What we had to sort out was where are the places where we can come together. Where can we change things and make them come together and blend. We tried to do some of it ahead of time. We tried to make some of the philosophical changes ahead of time. The ones that we could not accommodate were those that were driven by different rule sets. For instance, there's a rule that they would like to make everybody match on, tracking time. On the one control system their tracking time doesn't have visible points between the outer posing signals at a control point. So they can't issue tracking time within the control point. So they issue file time. Well, you can't impose file time on the former SP train dispatching system because they don't have file time as a rule, for one. Number two, they can issue tracking time within those opposing control point signals and the tracking time works and it's a positive form of protection, so why would you change it.

So we still are sitting with two completely different rule sets; file time on one side, tracking time on the other. A lot of different rule sets like that. Some of the rule sets that we still maintain are philosophical. On one side it's considered that you cannot have more than three overlapping maintenance of way in the same territory or two trains and one maintenance of way in the same. Then they gear the train dispatching system to follow that mindset, that philosophy. On the other side, even though the philosophy may feel the same, the computer system does not limit it. So, therefore, how do you just impose a rule on a dispatcher and say you can't have more than three people in there when it's not counting for you and giving you any back up. You're going to invariably end up with more than three, you're going to end up with a dispatcher in violation of a rule that was very difficult for them to live with to begin with.



So, you're going to end up probably, if you go into a system where you maintain two control systems separately, or you're in one office and people may think the same and want to come to the same place, but because of the train control systems you can't, you just can't do it. Which is going to drive you into a position that you've got to have two training staffs, which is sort of why I survived. You have to have somebody that can teach the one train control system. So you're sort of sitting there, please keep the other train control system for a little while. At least until you get in and learn their train control system.

You have to have somebody that can teach the rules that support it and the why for to understand what's happening. You need to involve the training staff on both sides of the railroad. When you get out to do an analysis of the two railroads that you're going to merge or the offices that you're going to bring together, use your training staff. They're effective tools, they can see things differently, they're going to see things that are different, that corporate won't. Or that the inventory people won't see. They're going to see things like a word, one singular word that used differently from one property to the next. And here comes this pepper can. On one side of the property there's a word that says "behind", it's written into their authorities. And in their rule sets "behind" means that an opposing train has passed a location. An opposing train has passed. On the other property "behind" just means the following movement going in the same direction. Imagine if you're talking to a man in the field, a maintenance of way or a train that wants to come out and occupy the main, and you choose to say "behind" about a train that's moving in the same direction and yet he still has an "after arrival" or a condition placed upon it, not to leave against an opposing train. And you have not just confusion, you have disaster in the making. One word.

To illustrate another use of how we can come up with words and what they mean, when I was 28 years old, and I hate to tell this story because I was beyond having to

know this, I got a peppermill for my birthday. My father gave me a little jar of peppercorns that went with it. He puts them in the pepper grinder and he's grinding them all up and he says now, that's what you do with these little peppercorns. I said what do you mean peppercorns. Peppercorns grow on a bush. He says oh yeah. I said but, dad, pepper is dirt. He looked at me like I was crazy, so did everybody else in the room. And I said oh dad, it says so right on the can, pure ground, right there. Somewhere in my childhood I read this, probably about third grade when I learned how to read. Oh, pure ground black pepper. You don't go around having discussions with people about what's written on the front of a black pepper can. So it never comes in up in a conversation. So you never questioned what it means. You never questioned what it means. You just put it away in some little drawer somewhere and you file it. So, all my-- Up until 28, I thought pepper was dirt and it tasted great, okay.

That really is a funny story and it's true but it illustrates what I'm trying to say about "behind" and "following". Here we have two different words, they-- I mean, we're going to have one word, "behind", but it means two completely different things on the property. We could kill someone with the misuse of that word. Two training departments have got to come together and understand when you send somebody out to do assessments or you're sitting in with dispatchers or you're trying to study each other's properties, listen to every word. Why are they saying that word. They keep saying that word, I wonder why they're saying that word, what does that mean. On this property what does that word mean. Because you know what it means to you but why do they keep saying it. Because that's not the way I use it. Question it.

I cut about three pages out of there so let me find my place. Alright, when you're doing this assessment and you're out there trying to find out all the differences-- I was going to bring a shovel but it wouldn't fit in my suitcase so I borrowed this from the hotel. Dig deeper, dig deeper, find out what's going on. Keep looking beyond the rules,

look beyond the train control systems, look at the support equipment. You might see some things-- Actually, your training staff might find some things because you're going to send them out there if you think about this. They'll see it differently, they may find these things.

We discovered that we had plug ins plugged in in the one office, where you put in the person that's doing the training, and the trainee plugs in next door. But we're going to put in these new plug ins and they're great and wonderful. The only problem is when you send the new dispatchers over there and you sit and train, they've got the old plug in modules and only one will fit in there. The two are too wide together. Training discovers this. Or you find out when you turn them over to a new track bulletin system that they've got the keyboard and the new software is there and everybody is on the right page, and day one you go to consolidate the track bulletins, to put all the Form As in geographical sequencing. And you find out there's no insert key on the keypad. There's no insert key on the keyboard, it's missing. And you're sitting there and you can't combine your track bulletins. And somebody calls up and wants to take a track restriction off and there's no delete line key on the keyboard either. You don't want to wait until the last minute to find that out. You want to know that ahead of time.

You're going to have issues like high wides. High wides that work great and wonderful on the UP CAD system, they have a fantastic tool that will just reach out and look right on the wallboard. Put reverse video display and I can see visually those trains that are moving down that track, that have high wides on them because they have this little highlight behind them. The computer system inhibits the movement of trains on passing tracks that don't have wide enough clearance. Rules department comes along, rules department has a lot of influence on what happens in the train dispatching office. They want to change so that everybody is on the same page. Everybody is going to handle their high wides the same. You handle your high wides the same, okay you do it

this way over here. Only problem is this computer system doesn't have reverse video. This computer system doesn't display where the track centers are too close, so we ended up handing a dispatcher a pile of papers this thick, defining where his 129" track centers are and making him remember it.

Sometimes you're going to have to maybe stop and think until we can get on a common system that maybe we're going to have to keep these things separate and apart. There's a valid reason why they need to be separate and apart. And then if you're going to do that-- I'm going to skip one, two, three more pages here. You're going to have to get all your supervisory personnel in together. You're going to have to get porter managers, everyone that supervises a train dispatcher, director level, maybe the signal tech desk, resource managers people, anybody that's going to have any interaction with the dispatchers. And you get them together and you get everybody trained. You get them trained on both systems. If they're going to be supervising these people the questions are going to come up, things are going to need to be answered. There are going to be confusion points. Then if you have them trained ahead of time or at least have some kind of heads up to them about what's going to happen, they'll be better prepared. You want that supervisory personnel to know what's going on. You need to invest in them, make them a part of the transition. And if you're going to invest in anybody, invest in training the trainers. They're going to be under a lot of stress. This is stress, this is stress.

Trying to get all these trainers taken care of, to get new trainers in the seat for the trainers that have left, they're going to have to develop new training programs, probably on their feet as they hit the floor. They will have to maintain the training programs that they've got if they're keeping up two train control systems. You've got recertification programs, all these other things going on simultaneously. So, train the trainers, give them some skill upgrades. Let them take some computer classes even. Harvard Graphics or

Powerpoint, you might have ended up with something up here to see instead of just listening to me talk. They're going to need all the skills they can get because they're going to be under a lot of pressure during a transition.

The issues about maintaining the training staff is no different than maintaining your train dispatching staff. You need to anticipate what your losses are going to be. I think I mentioned once before that a training staff doesn't necessarily want to go out and live in the middle of the corn fields with the cows and Dan, tell James I said that. But it wouldn't hurt him to come up there and live with us. I mean, he could find his way home because we name all our towns after the water towers. All you have to do is look on the water tower and you can find where you live.

But you've got to anticipate that you're going to lose part of your training staff. You need to recruit them ahead of time, get them in, get them trained. Besides which you're going to need people to relieve the trainers. If you bring over only one person to support the one training staff, who's going to relieve her for vacations and when she gets sick. She's made sure she hasn't gotten sick for a year and a half. You're going to have to anticipate what the losses are going to be on both sides.

I'm going to wrap this up. I've cut out a lot of material and I probably have not kept it real cohesive. I hope you heard something that might have helped you. Training is one of the places where I think you can ease a lot of the pain through a transition period, the consolidation or the merging of two railroads. Bringing the two training departments of a merging railroad together and doing it in an open minded, learning atmosphere can only benefit the outcome of a merger. If you just remember one thing, it's the things that you don't think about, it's the things not considered that are going to get you in trouble on the merger, then you probably won't have any problem with it.

Now, at the end of my outline I said I had four "P" words and four "T" words for you. They're self-explanatory; a predisposition about mindset, about what the training

department can offer you. Planning, planning, planning, planning, I guess I don't need to explain that you have to plan. Preparation, the practical side of maintaining two train control systems and what you're going to have to do to support that. The "T" words were timing, that needs no explanation. Tolerance in the timelines, no tolerance in the flexibility of the schedules. You're going to have such tight schedules you'll be hard pressed to keep up with them. Tractable was my fourth "T" word. I had something in mind when I wrote the outline and then when I went to sit down and write the words that went with it, it didn't work. Then I looked it up in the dictionary and I found out it meant easily led, obedient, malleable. I really knew I was on the wrong track because anything to do with dispatching and merging and training and anything has nothing to do with easily led or obedient or malleable. So, I picked a different "T" word and it was terminate, as in this presentation is over. Thank you.

(Applause)

MR. RASLEAR: Are there any questions?

Q: You must have had an enlightened boss. How do you go into a dispatching office, get involved in the minutiae of an operation, and convince your boss that there are cultural differences that require you to keep your systems separate?

MS. DOLL: You go through three bosses.

(Laughter)

## **Dispatcher Training for a Centralized Operation**

Roger Cummins, Training Officer, CSX Transportation

MR. RASLEAR: I hesitate to ask are there any more questions. Well, you've given me a new perspective on gaining weight, a problem that I'm facing. Our next speaker is Roger Cummins from CSX. This is another program change. We were supposed to have Margaret Downey and she couldn't come. Roger is Manager of

Network Operations Training for CSX in Jacksonville, Florida. For the past three years he has been involved in providing training for new hire dispatchers, incumbent dispatchers, locomotive management, and coal department employees at the Networks Operations Center. Roger has 25 years of railroad experience, including 17 as a train dispatcher. Of those 17 years as a dispatcher Roger spent 7 working in a centralized dispatching office. His topic today is "Dispatcher Training for a Centralized Operation". Roger Cummins, please.

MR. CUMMINS. I'll start out a little bit, give you an introduction about our training. Even though we had centralized train dispatching-- The centralized train dispatching office was opened in May of '88. No, our dispatchers did not really become a problem. Before centralization, as other people have mentioned, we had operators. You know, they knew what dispatchers work was, they were rules qualified, whenever we needed a train dispatcher we just went out and promoted from the operator ranks. But, as you know, with the new technology and the disappearance of an operator giving a train train messages, train orders, the old clearance Form As, well with the computerization all of that went out the window and all the operator jobs on CSX were virtually eliminated.

So with the consolidation we had a surplus for a while because we combined some desks. We went down from maybe 500 dispatchers, down to about 200 and some. So, we had a surplus after several years. But the problem was that most of the train dispatchers that came down there, when we did our little pie chart and graphics and things, we look and here's average age 46. We have all these people that are about to retire in the next few years.

So when that started happening to us, it was about four years ago, we found out that there was no pool to draw from, there were no operators. The few that we had out there were at different locations, they didn't want to relocate. Plus they had good

seniority and nobody wanted to go on a dispatcher's extra board at a centralized office for about ten years. So, it caused quite a problem there for us. What we needed to do then was to develop a training, a classroom training, for people with no railroad experience, new hires.

Because before an operator, they were rules qualified. You may spend a week with them going over the rules, and you go in and introduce them to Joe, sit here with Joe, he's going to teach you how to run a railroad, and that's the way it worked. But today we get new hire dispatchers that have no experience at all on the railroad and we have to have extensive classroom training. Now, a lot of this has been covered earlier but I would just go over the way that we do it at CSX.

One thing I want to do is give you a little background of the environment that our new hire dispatchers are working in in a centralized location. Okay, so the environment that our new hire dispatchers work in today is a lot different. It's centralized, we have all of our dispatchers sitting around on three levels in a center. And a lot of you have seen a centralized location but you take someone that's just come out of college or maybe a manager at Wal-Mart and boom, you take them in there, it's quite impressive. So we try to show them the environment they're working. And this is the outside view, it's known as the round building, which houses the majority of our dispatchers. We have a few dispatchers that we've had to move on to the second floor of an adjacent building.

But, as you can see, it's a theater type atmosphere, there's no windows, there's only one entrance door and then there's an exit door. So it's quite confined and a lot of people just do not like to work in an environment like that. So we take them in and show them a little bit about it. We have three levels in there. This is a dispatcher on the second level. We use nine foot projection screens all around the round building, facing toward the outside, rear projection. I think there's about 140 in there. And, as you can see, everything is color coded, as was mentioned earlier. If we have a high wide the data will



be red on this screen, if a train is running ahead of schedule the alpha would be green. So there's a lot of color codes and things that the dispatchers, the new hires, must learn.

Then also we have chiefs and assistant chiefs that work up on the second level, that you can see. That we're just having-- There's three levels in the center. The first level has about 27 dispatchers that look at the nine foot screens. Then our second level has chiefs and dispatchers, that use 13 and 19 inch monitors. It serves the same purpose, it's just not quite as impressive. Then we also have a third level that's virtually the same thing. We also have a director, our supervisor is on the third level in the center.

And that's just a little outline. Forty-seven dispatchers, 13 chiefs desks in there. And we have a little alpha desk assignment. All of our train dispatchers are in Jacksonville, so for proper radio procedure, of course, we would use whatever desk that covers the territory, such as the AA train dispatcher Jacksonville, AB, and so forth. We also have about four desks upstairs.

But that's just a little bit of the layout. I just wanted to show you what the new hires, when we bring them in and show them about the environment that they're going to get into-- It's pretty stressful. It's a low light environment and it's very busy in there, of course. Now some topics that we want to cover today about dispatcher training from a centralized location; we want to talk about our selection process, which has worked very well. We have a training timeline. A little bit about our training equipment that we use in a centralized location. Some of the materials, the curriculum, and the rule books and things that we use for training. And also some requirements that we have set up for our new hire dispatchers. Then I'll talk just a little bit about some lessons that we've learned in the last three and a half or four years with our training system.

With the selection process, of course it's made from recruited applicants. What we do is we have some tests that we include and these have worked out very well for us. The Industrial Reading Test, this is just a basic test and measures the ability to read and

comprehend on a tenth grade level. Our rule book is supposedly written on a tenth grade level. So that's one thing that we want to be sure that they can pass that test. And then the Critical Thinking Appraisal, this goes with the measuring of analytical thinking and reasoning ability. And it's also been a good guideline to give an indication of how these applicants will fare in a classroom environment. If they do well on this score then usually they do when they're in the classroom environment.

Then we need a stress test and this test measures the applicant's ability to work under pressure and to handle multiple tasks simultaneously. Of course those are two things that's very critical in the dispatching center. Then we do a math test, it's just a basic math test, including fractions and decimals. Then we have a Hogan Personality Inventory. This is a well-developed personality measure for workplace settings. They're evaluated on dependability and their conscientiousness, on the ability to handle deadlines and make good decisions under pressure. The ability to interact well with others. Someone mentioned 74% communications, so that's very important that our new hires can interact well with others.

And the ability to learn in a classroom environment. We can also see from that test whether they're going to be able to go 14, 15 weeks in a classroom environment, eight hours a day. Almost every day something new is introduced to these new hires because every bit of it is different. It's pretty much of a strain on them. Now these tests have been validated by an internal research study with CSX. Doug Clipper does that, I don't know a whole lot about that. But what we do is we've collected test information from incumbents. When we first started our training program we took all the dispatchers in the center, give them a day's pay, and give them a test. Then we took the average of those to kind of be a measuring stick at the beginning on what we were going to bring into the center. Then we also evaluate how they do on their tests and how their performance is after they leave our training. We follow up with this and see.

The results have been highly favorable in this. So to be selected as a train dispatcher trainee they must pass all these tests. And then we also have-- We do a panel interview that's about twenty minutes. Since it's been mentioned a couple of times we might out to play a game of chess, see how they do on that. That might be a good thing to do. Of course, we do the standard background checks on the applicants.

Now our training timeline is broken down into two phases. Phase one is approximately 15 weeks of classroom and some field trips or field training. We take about a week-- First off, we want to get them safety certified, and know a little bit about the railroad, and then put them out on a train. Because very few of the people that come into our classes have ever ridden a train. So we want them to go out and just get a little idea of what it's about. Then we also take them to some major terminals, some hump yards, to see how those operations are. And then we do 14 weeks of classroom training, curriculum based training.

Then phase two is 18 weeks of on the job training. They're required to qualify on two desks before they mark up as a train dispatcher or two dispatching districts. So that gives them a little more experience and it also is helpful to us. When they go on an extra board, they can cover two desks. There's no way anyone is going to learn all 47 dispatching districts in there but we try to get two at the beginning.

Now on this OJT, I'll talk a little bit about it later if I have time, when we get into that portion-- We do have a workbook or an outline guide to how many hours chair time we expect a student to have the first week, how many hours of chair time the second, the third, and so on like that. That way the chief dispatcher can monitor their progress. If they're not getting chair time, that's about the best way to look at it. If they can't sit in there under supervision and work three or four hours after they've been in there a couple of weeks, then they probably have a problem. And it's difficult to weed new hire dispatchers out because a lot of them are used to tests. They've all been to college and

things and we do like-- It's probably 75% multiple choice, 25% essay on our tests. So they're pretty good at that, cramming and studying and things. But when you get in there and sit down and start putting all that together, making practical application of what you were tested on, then you'll see some people that just cannot do that. But we keep pretty close tabs on them whenever they go into the OJT process. But my training involves phase one, phase two is handled by Cheryl Bowen, our director of dispatching.

The next thing I want to talk about, if it will come up here, will be our equipment that we use to train. One thing that we have is we have eight simulator workstations in our classroom. We can load any dispatching districts, any of the 47 dispatcher districts can be loaded on to our simulator. That way we can let our new hires practice, role play with each other if you will, learn how to learn signals and switches, how to issue track warrants or 704s as we call them to maintenance of way. Learn how to use the auto-routing and everything. It's really a good system that the Union Switch and Signal provided for us for training purposes. And we also have a projector where we can project-- Where an instructor will show them how to use functions and we'll project it on the screen. Then the students will turn around and practice those functions on their workstations.

We also have an av-tech or a touch screen for the communications so we can teach them a little bit about how to do the radio communications, how to answer radios, the next queue button when they stack up on them. And telephones, how to conference and things like that. Then we can also use the PC projection, such as this, to show pictures and slides. Just certain things like explaining a trailing point switch and a facing point switch. If you have a picture of that, that's a lot easier than trying to stand up as an instructor and explain that. So we have some pretty good tools down there in Jacksonville that helps us with the new hire dispatchers.

I'll talk a little bit about the training materials since my Powerpoint must be saving or recovering here, it's not going to move over. Some of our training materials that we have are instructor based, objective based curriculum. We also use, of course, the operating and safety rule book. We use instructions on our computer aided dispatching system, that we call CADS. We have procedural instructions in how to use that. We have a procedural instruction manual, if you will, for best practices on doing things in the computer. We also use some multimedia pods that they were talking about, some self-paced study. We do our hazardous material awareness on that. Our safety certification and things like that. So that helps out quite a bit.

We have a library that is about 80% complete on a narrated road review video. What we encourage our new hire dispatchers, whenever they find out the dispatching district, that-- She's working now. That wasn't exactly what I wanted. What we do is encourage our new hire dispatchers, whenever they get ready to go over into the centers, to take those videos and watch them. There's just a lot of information and we usually take a road master or a road foreman of engineers, a train master road foreman engineer, that rides a GRMS test car and narrates that track for us. It's been quite successful. I know there was some talk about that a moment ago. We do not, by any means, tell them that that's a substitute for riding their territory. The policy is, if I'm understanding it correctly, that the new hire dispatchers ride their territory before they work that position.

Now our training material is broken down into seven modules, approximately seven modules. Each one is maybe from a week to three weeks in length. One of the first things we do is we have a basic railroad concept, we call it Boxcar 101. Our new hires, they just don't-- They have no clue what a van, a pig, a tank car, and all that. So we have about three days where we take them around into a yard and teach them information concerning cars and things like that, just basic railroad knowledge. Also during that time we give them a book, we call it the jargon book, that tells them what a

knuckle, a draw bar, strip joint, and all that, that they hear on the telephone. They can look all that up and tell what it is.

There was a story about a road master that had a new track inspector, I don't know if this is true or not, he called him during the middle of the night. We had told him we had some bolts out of a joint, you know. So we called and the wife answered, said yeah, want to talk to your husband, I need him to go check out a strip joint for me. She said I don't think so. So, we always get that jargon book out so people won't get too confused there. But there's just a lot of things that we need that book for. It's been very helpful for us, it's well developed.

Then we also teach them right side of the keyboard in a module, where we know how to align switches and signals. How to put up blocking devices and things like that. So that takes about a week or two, that we go through that. We call that the right side of the keyboard. It's just switch blocks and things like that. Then we have a module that deals with delay reporting, train delays, which it just seems like we create more forms but we never get enough about the train delays. If you work a chief's job, you get a call at home or something, someone forgets to put delays in. So we try to tell them how important that is. Then we also go over how to transfer from one shift to another. We do that in a module.

Then we have a communications module to teach them proper radio procedures and our 400 rules, which are concerning the radio rules and how to answer the radio and telephone. Positive identification and things like that. Then we have a module which we go over 704s, that's how we do our short term protection for maintenance of way. That's usually a couple of weeks and that's a lot of intense hands on. We go through the rules-- By the way, we go through the rules, we kind of break our rules down into modules. We don't just go through the rule book and then start the training. So we'll pick applicable rules to each module, we'll review those, then we'll show them how they would put it in

the computer, and then we would practice it to see how they would comply with those rules.

Then the last module that we teach is train messages or train orders, whichever you call them. We go through that and how to put out your 707s, your work authorities, in conjunction with maintenance of way employees like that. Then we have a final test, it's probably about 139 questions. It's an extensive final test to review everything that we went over. Of course, we do good reviews on our tests and things like that but we require 90% on all of our tests. Unlike the gentleman before, if they do not make 90% they're released from the program. There's no retesting, which I'm not so sure that I agree with that. But that's been our policy from the very beginning.

And we also give them two practicals. That's where an instructor sits down at a simulator workstation, as I said we have eight of those, and we just run them through the mill. We'll role play we're an engineer, a maintenance of way employee. We put several trains out there, we create trains in emergency, we hit automobiles at crossings, we have trains derail. We just see how they would react to those things. And that's a pretty good judge if they know what's going on but by no means-- Our training is just to teach them the rules and how to use the CADS computer and relate the two together. The 18 week phase two is how to teach them to dispatch, we don't try to do that. It would just be too much.

So we give them a non-written exam and those two practicals with an instructor and then on the OJT they must progress week by week according to the guidelines that we hand them in the workbook. And, as I say, we judge that largely on the chair time that they can get in and also by interviewing the training dispatcher that they're sitting with. Then, of course, the policy is, if possible, I'm not positive today, but one of them go out. But we do try to get them to ride their territory before they work their desk.

Now the last thing I want to talk about is some lessons learned from about three or four years that I've been involved in it. One is that we could reduce field training. When we first started we'd send our new hires out maybe for a month to ride the road and things like that. We realized that that was just too much. We need a generalization, things like that. What we do now is we try to bring in subject matter experts, which have a great presentation that they can bring in without really going out there and staying that long in the field. So we have reduced a lot of our field training. We've probably reduced it by about four weeks since we first began the program. But we do have subject matter experts that come in from the maintenance of way department, engineering, signals, they come in and talk about how all that voltage and everything works. And the communications, how that works and all that. So we do have our subject matter experts that come in. Then we allow them maybe to go with just a day or two, instead of a week or so. Because we found out we were not really using our time wisely in that. And hands on practicals. Give them scenarios to work out. They just love that. I was thinking about this room here, I thought boy, I could get some good scenarios to take back to my class because they always want to-- You know, they can learn a function but they don't really know what's going to happen out there. So you need to have a lot of hands on practice with scenarios, with situations that are going to come up while they're in the center. And I went through about 14 classes and every class says well, you didn't tell me about that. You can't tell them about everything. Even though you try there's going to be some things come up you just can't remember.

And focus on rules and procedures. That's really what our training is about. We expect our new hire dispatchers, when they get through the 15, 16 week program, to know the rule books. To know the rule book and the safety rules and also the procedural instructions on how to use the CAD system, the computer. That's what we want to teach



them, then we send them over to phase two and let them learn how to be a train dispatcher.

We receive feedback from students, that's very important that we receive a feedback from our students so that we can improve our training and also see things that we've done that were incorrect. Is that my time there, the light. Okay, I've got just a couple of more minutes.

One thing, a full time training office has been a big benefit to us. Now —(end of tape)

Our training program's pretty good. I'd say we have about 80 percent retention if anyone would be interested in that. That's about 10 and 10; 10 quit and 10 can't make it.

Just a rough ballpark figure: From the time we run day one orientation till they sit in a chair the first day, we're looking at 30, \$35,000 a piece.

Any questions?

Q: I noticed you only qualified them on the two desks. Of course, once they're comfortable on those two desks, how much training do you give them to add to that?

MR. CUMMINS: Training on those two desks, or the other 45?

Q: Well, the other.

MR. CUMMINS: Here's the deal. We have a guaranteed extra board. So they're guaranteed 30 hours a week. We don't have any part-time train dispatchers. So if there's no position for them to work on an extra board, then we assign them the third desk to come in and set in and learn that desk.

Q: How long is it then before they're qualified on the third desk?

MR. CUMMINS: I've seen them do it in two weeks, but I wouldn't think over a month, a couple of weeks or something. It's gets a lot less as they go along and get the

experience, especially if the desks are adjoining and things like that. But if they're not working, they're training for a 40-hour work week.

Q: You mentioned you're using the AVTEC. Do you have an in-house training program on that, or is that just a dead screen? Or do you have a live connection, or some kind of roleplaying tape?

MR. CUMMINS: Really what it is, we can simulate radios that go off and also answering radios and patching from-- We have a dispatcher's channel which is our own private channel, and then we have a road channel, engineering channel like that. So we can communicate with them. But it's fairly restricted in what we can do.

Q: Did you develop that inhouse or did AVTEC develop that?

MR. CUMMINS: No, Dan Pinkley, our communications specialist, helped us with that.

Thank you very much. [Applause]

MR. RASLEAR: It's time now for lunch. Lunch is going to be served directly across the hallway from this room, and I guess I'll see you all over there.

[Break]

## **Training for Life**

James T. McQueen, Associate Administrator for Railroad Development, FRA

MR. RASLEAR: The speaker this afternoon is James McQueen. Mr. McQueen joined the Federal Railroad Administration in 1980 as director of the office of passenger services with responsibility for policy and funding programs for Amtrak, the nation's inter-city passenger railroad for financial control of the \$2.2 billion Northeast Corridor improvement project.

In 1987, he was appointed associate administrator for passenger and freight services, adding responsibility for programs, providing technical and financial assistance to shortline and regional railroads.

In fiscal year 1990, Mr. McQueen was named associate administrator for railroad development, adding responsibility for the agency's research and development activities.

Mr. McQueen is also responsible for FRA's next generation high speed rail program.

Prior to joining the Federal Railroad Administration, Mr. McQueen worked in a number of supervisory and analytic transportation positions, including positions with the US Office of Management and Budget, New Jersey Department of Transportation, Urban Mass Transportation Administration, Washington Center for Metropolitan Studies, and National Bureau of Standards.

Mr. McQueen is a native of Newport News, Virginia. He received a BA in mathematics from Hampton Institute and an MS in transportation systems from the Massachusetts Institute of Technology. He is also a graduate of the advanced management program of the Harvard Business School.

Currently, Mr. McQueen directs fundraising activities for the Washington, DC chapter of the National Hampton Alumni Association.

Would you please make welcome Mr. James McQueen. [Applause]

MR. McQUEEN: Thank you very much, Tom. I'm obviously substituting for Administrator Molitoris who sends her regret she couldn't be here today. As Bill Clifford indicated, I apologize, I can't bring her enthusiasm, so you're going to have to bear with me, I can't bring that. But I do bring you greetings from her.

I've enjoyed this seminar this morning, very instructive and thoughtful presentations. This is my first session like this on dispatcher training, but it was very

helpful to me. I thought the presentations were excellent. Tom Keane, I thought, did a very good job of going over some of the elements that make up a minimum training program for dispatchers. I thought Tom also did a good job in handling the question of whether we were going to request standards or just try to be helpful. But, Tom, that was good. I'll report back that you didn't give away the store, but you did get the message across. That was very good.

I thought Judy's presentation on the objectives for a training program, I enjoyed that very much. The message that no one size fits all I think is something we all adhere to at the department.

The framework for evaluating training programs, I took away a lot from that. Steve always does a good job and I'll see him tomorrow.

Bob McDermott's presentation on what you do at the Long Island Railroad, I took a lot from that. The attention to detail at the Long Island Railroad exercises in its training program, I can understand that. There are millions of people you carry every day. Very good presentation.

Pat, I enjoyed your presentation. You made the point that dispatcher training, all training but dispatcher training is an essential element given the expertise and the skills that dispatchers have, and it's very difficult to replace it and you have to have some idea how you're going to do that when you join two programs. Very thoughtful.

Roger Cummins's presentation on CSX's training program, professional, well thought out, a major investment by the railroad. I enjoyed that also.

So I really enjoyed the presentations. I've taken a lot of notes and you could've charged me to come because this is something that helps me in my work.

I'll try to give as much as I get, but I've enjoyed the session so far.

Let me get to my remarks now though. The title of this talk this afternoon is "Training for Life." The conference where we're here today is a direct result of the first national transportation dispatcher safety assessment that was done in 1990. As you heard this morning, that report found several issues that we have with dispatcher training, variability among railroads in the initial training, inconsistent standards for outcomes, the informal and variability in on-the-job training, and uneven practices and retraining and familiarizing dispatchers with their territory.

The FRA's preference at that time was to let the industry work that out, and for many years we stood and watched to see what was happening. But in 1995, we did another assessment, and Administrator Molitoris found it necessary to issue another report to Congress, and that report found some of the same issues. Again, inconsistencies in both dispatcher and supervisor training. Opportunities for periodic retraining were uneven and sometimes not available. And the problems with retraining and preparation for handling a new technology were also inconsistent.

So the project that you're involved in today is a direct result of the findings from both of those assessments.

The ultimate success of this project is based on what you at this workshop and your colleagues, how you handle the information that we develop. Our goal for this workshop is to provide information and a forum for the industry on this vital topic, so that we, both the FRA and the industry, both labor and management, can say that dispatcher training is now a model for other crafts.

We're not looking at a regulation, we're not looking for a standard. But we are looking for information that is so good and persuasive that both labor and management will leap at trying to implement it.

**Training for life.** The first aspect of that is that in today's rapidly changing technological and economic environments, lifetime training must be a part of the entire process. Training is a necessity, not a luxury, to maintain and enhance job skills and to keep pace with the changing technology.

The report on dispatcher training which I am told you will get within the month is in fact a response to changes in the industry. As technology has eliminated the need for jobs in the railroad industry, such as block and tower operators, which traditionally provided on-the-job training for dispatcher positions, report recognizes the need for formal training for applicants from outside the industry.

Second, increasingly sophisticated automation and computer tools are being introduced to the dispatcher's desk, such as computer-assisted dispatching. Such technological innovations extend and enhance the dispatcher's ability to process information, plan movement, make decisions, communicate and keep records.

However, if these tools are to be used effectively, dispatchers and their supervisors must receive training on their application.

Finally, in the spirit of lifelong learning, the report recognizes the need for periodic refresher training to maintain skills and learn new skills as technology continues to advance in our industry.

The second aspect of training for life is just that; training for life because such training can be a life and death matter in our industry. What I'm referring to is contained in the report, which you will get shortly, but basically what it says is for dispatcher training, we need to demonstrate the ability to apply lifestyle training, and in particular information about shift work, to prepare for a career as a train dispatcher.

The life and death issue here is in the management and prevention of fatigue in our industry. Technology will never eliminate the need for dispatchers, and dispatchers

can and will become mentally and physically fatigued. When hours of service and fatigue are discussed, the emphasis is often on train and engine service employees. However, we are all aware that dispatchers are also covered under the Hours of Service Act and are subject to fatigue.

Railroad dispatchers perform a crucial safety sensitive job in which many decisions are made that can be adversely affected by fatigue. Thus, dispatcher training must also include training and education on the effects and causes of fatigue and countermeasures to combat fatigue, for we choose life over the other alternatives.

Specifically, knowledge of the physiological and behavioral factors that accompany fatigue are important elements of dispatcher training. We know this information is vital because some people may not know when they are too fatigued to work safely. Knowing how to avoid fatigue, what conditions cause fatigue and how to cope with fatigue is important for all railroad employees, including dispatchers.

Many railroads have educational materials on fatigue that are distributed to interested employees. But some railroads only provide such education to train and engine employees, and some provide no information at all. That's not good enough.

Information about fatigue should be widely available to all employees and their families so there is a heightened awareness of this problem throughout the industry.

Families need the education so that they know what they can do to help the employees get good quality sleep. Job-specific training on fatigue is necessary so employees and supervisors are aware of the aspects of the job that contribute to fatigue and how fatigue affects safety critical aspects of the job.

Claire Orth and her staff, as members of the research and development office, are currently conducting a number of studies on workload stress and fatigue. A particular effort we are involved in involves dispatchers and how to determine how workload, stress

and fatigue interact in a dispatcher's job. We know from the literature that a person who feels stressed, overworked, and fatigued is more likely to make mistakes, more likely to have health problems, more likely to abuse alcohol, and more likely to be absent from work.

But we do not know how the specific aspects of the dispatcher's job contribute to workload stress and fatigue, or how workload stress and fatigue affect the dispatcher's job. Our first step in this effort will be to find the best way to measure the workload stress and fatigue experience by dispatchers, and in particular by dispatchers working different shifts in different types of operations at a different desk.

We have done this work with train and engine crews already and we are now going to tackle this task with dispatchers. When we have the measures established, we will then identify the factors that are important in generating stress and fatigue in the dispatcher's job. Then we will look at how different countermeasures affect the reduction of stress and fatigue. That information then can be used in training programs and educational material for railroad dispatcher training programs.

Which brings me to my final point. The FRA's doing research and providing information on training and on fatigue because we believe that fatigue plays a major role in human factors accidents. Our mission is to ensure safety in the nation's railroads, and this is directly related to the accomplishment of that mission.

Railroad employees, such as train and engine crews, dispatchers, have cooperated in our research efforts to date. They've done so because they see the benefit in our efforts. But what is the benefit of this research to management and the carriers? We believe that employees who are less stressed and less fatigued will be more efficient in their jobs, moving more trains and increasing the bottom line. Dispatchers who are less stressed and less fatigued will also be healthier and will be absent less, which also means lower costs.



So educating and training railroad employees, and in particular dispatchers, is a win/win situation. That's why I said earlier that the ultimate success of this effort depends on you and your colleagues.

All railroad employees, including management, must train for life. Thank you.

[Applause]

## **Using Area Community Colleges as a Training Resource**

Andy Burton, Academic Director, National Academy of Railroad Sciences

MR. RASLEAR: I'd like to welcome everyone back from lunch. I hope you all agree that this morning's session was a success. [Applause] Thank you, thank you. That was mostly intended, I am sure, for all of our speakers.

The afternoon session is going to focus in a slightly different fashion. We're going to hear a little bit more from non-railroad folks. We're first going to hear from Andy Burton. Andy is the academic director of railroad operations technology at Johnson Community College in Overland Park, Kansas.

Andy retired from the military after serving 20 years as a judge advocate general corps officer. His last assignment before retiring was as director of the legal school, coupled with a faculty teaching position at Vincennes University, Indianapolis, Indiana.

Andy began his community college experience in 1989 as district veterans coordinator, and is a licensed professional counselor, and he's going to talk to us about the area community college as a resource for training. Please welcome Andy.

[Applause]

MR. BURTON: Thank you, Tom. This is going to be a hard act to follow after that great lunch we just experienced, so I hope I'm animated enough to keep everybody awake; that's my first challenge.

What I'd like to do is offer some recommendations and some ideas, if you will, about using an area community college as a training resource to the industry. Specifically, the National Academy of Railroad Sciences was established to provide an umbrella for training across industry lines for the railroad.

We train personnel for every major railroad in the North American Continent, as well as shortlines, and the reason that I say North American Continent is because some of our candidates and students seek employment in Canada and we're opening the door for opportunities in Mexico. So it is truly a North American type training center.

What I'd also like to put a disclaimer about, since the focus of most people here is dispatcher training, dispatcher training was established at Johnson County Community College, it still is on the books, but it has physically been located down at Fort Worth, Texas at Tarrant Junior College in Fort Worth, Texas.

In the audience, I would like to just have three individuals stand, if they would, to be recognized since they're handling that program down in Texas. The school administrator is Gary Marsden, and from the railroad industry, Dan Bodeman, and supervisor John Grundman. They represent the BNSF side. I would like to defer any questions, if you have specific statistical questions to those three persons. How's that for a disclaimer up front?

Basically, I'd like to outline a little bit about the program. We enjoy a partnership with the Burlington Northern Santa Fe Railroad. We were the first college to establish that, contrary to belief from the latest railroad magazine that was published, and we can debate that later.

What I'd like to do is walk through this process and see what area community colleges have to offer for the training industry; the first being area community colleges can be used as a resource for training. This source is cost effective.

I'm not planning to insult anyone's intelligence in reading, but since this is being recorded, I wanted to make sure it's on the tape.

The source also provides high qualities for employment candidates.

And it's a place where industries' competencies can be developed. So we're trying new and innovative things quite often.

It's very effective in cutting down costly travel, development fees and instructional expenses. There is an industry-wide need to hire people for basic competencies, to ensure our job effectiveness. We need to focus on validating those competencies versus training the employees.

And there's barriers with anything; barriers/opportunities. The collective bargaining agreements often offer us a challenge. We need to influence entry level employment standards in the overall training process.

Together with the union and management, we need to do a few things -- raise the entry level to education standards. The reason that I put that down is the only two sourcing elements that I know of for people to come into the industry is job service with whatever state you're representing, the state employment office, and a community college type setting. Those training modalities are offered for that specific reason.

We need to also release the gains by employing trained personnel.

Where do our top picks from the high school graduates go? Some go to college, some go to technical schools, and those that are not the top picks find work where they can, they don't always have what the industry wants, and if you think about it, how many industries today still require only a high school education to get in? Quite a few.

We need to stress competent personnel, computer literacy, better communication skills, such as reading, writing, and listening; that's very important. We need to develop some human relations skills, supervisory and leadership skills. We need to train our

people to be team players. A very hot button nowadays is conflict management/conflict resolution, and our workers need to become problem solvers.

A lot of high schools provide general entrance into these areas, but they don't focus or polish those personnel. We can do pretty much the same thing at a community college or another training resource in a period of one to two years.

Here comes the associate degree. I'm going to show you the format of it, if you will. If the general population says, "Let's go after an associate's degree. What do we do?" They first come, depending on what entry level they have, because our current standards require 30 semester hours of college, and we're hoping that those are in the areas of reading, writing, and math skills. They have different semesters in which, for example, to acquire these 30 semester hours.

Then for the conductor program, there's a fourth semester where they would go into training, and the candidate pool shows that each person has 30 semester hours after they've gone through this process. They can either come in with 30 semester hours and go straight into the candidate pool for training, and if that's the case they immediately go into conductor training in this case, and then they become a full-fledged conductor. Since the industry has demonstrated this, their next promotion potential is to locomotive engineer by federal union regulations.

All of this is pretty much the same, except for the dispatcher. The dispatcher comes in with the general population, they acquire those 30 semester hours of skill necessary to meet the 30-hour requirement. If they have 30 hours, they go straight into the candidate pool and straight into dispatcher training.

The Railroad Associate Degree Consortium. We currently have 18 community colleges participating with the railroad industry for railroad-related training and skills.

We're receiving applications all the time. This viewgraph is currently incorrect because we just approved five more colleges.

What it basically does is develops the four core courses, which are railroad history; technical careers; railroad operations; railroad safety, quality, and environment.

The accreditation process is very active and the numbers, as I mentioned, the members are increasing all the time. The Consortium trends-- the hope is to increase membership and work with other railroads to identify locations where employment needs are high. Say, specifically, if you wanted to go to a particular town and you wanted to recruit students for the program, if you just did a newspaper blitz, advertising that after six weeks training, if it's the conductor's portion, or 14 weeks training for the dispatcher's portion, you could go to school and then secure a railroad job.

I know of no other industry, and I've been in education for a few years now, where the return is so great for such a short period of time for training. These young men and women, their salary ranges are 30 to \$40,000 just starting out with just one year of college. I think that's a pretty good deal.

If you choose to get involved in the Consortium, if you don't have an area college, contact those colleges and encourage them to join in, because we need to continue working with trained personal to increase our relationship with our sourcing personnel.

When we train folks, it doesn't do us a whole lot of good to give them a lot of training if we can't place them into the job market, and our job placement is really high. I'm almost reluctant, I'm getting gun shy to tell how many percentage points we have in placing. It's almost at 100 percent for job placement of qualified candidates.

Now, what happens, since I'm in a school setting and with students' right to privacy, I can't ask them how many DWIs do they have, do they have any arrest, and then when they fill out a job application, lo and behold, this jumps off the paper and the

people from the HR say there's no way this person is going to get employed. But I as an education institution screen them as well as I can without asking those illegal questions and try to bring folks on board.

But that basically covers the program. I just want to make sure that everybody knows that the dispatcher program, if you haven't heard, is at Fort Worth, and it was very politically correct for it to go down there, because that's where the control center is, and that was their thought process.

I'd like to open the floor if anyone has any questions.

Q: Do you have a list of the community colleges, and do they all send their people to Fort Worth?

MR. BURTON: I have a list of those colleges that are participating in the Consortium, and I can provide that to Judy, and then we can make sure those get out. I've got everyone's address and I can mail that out.

Q: Those that participate, when they get a student that signs up, they send them to Fort Worth?

MR. BURTON: That's correct, and it's the same way with the other programs. The other four areas that I deal with are mechanical, maintenance ... welding, and the conductor. The dispatcher program is still on our books because we've gone through the process of getting it accredited.

Q: What's it cost for someone to go to a dispatcher program?

MR. BURTON: Gary, do you want to address that? The conductor's program, for example, is \$3,357 for an out-of-state person, and an in-district person is \$1,761.

GARY: Currently, the cost that we have on the books for the dispatcher program is \$6,500, and that covers that 14 weeks.

MR. BURTON: That's still a pretty good return for their money.

Q: Is there a core curriculum, English, history, anything like that, associated with your program?

MR. BURTON: We have two different approaches. If the person's motivated to seek employment immediately, either with the six-week, in-class experience, or the 14-week class experience, the distribution of credits, if their ultimate goal is to get employed, it can be in basketweaving, I don't really care as an accrediting person. But if their ultimate goal is to get the two-year associate of science degree in railroad operations technology, then those distribution credits we very closely look at. It has to be the proper distribution in English, math, and science.

So to answer your question, if your goal is to get a job, I don't care what your college credits are in, as long as it's from an accredited institution. If your ultimate goal is to get an associate degree so that you'll be a better qualified candidate for railroad promotions, then, yes, we closely scrutinize each and every class.

Q: As part of your curriculum, do you require your students to have so many hours of English that you instruct at your facility?

MR. BURTON: No.

Q: Is there a college in the Chicago area that's participating in this?

MR. BURTON: There is a college in Illinois that has made application and they are currently in the process of being accredited.

Q: Are any of the colleges, or is your college doing any outsource contract work? In other words, if a railroad wanted to contract for some specific training, are you in that business?

MR. BURTON: Well, I cannot speak for my BNSF corporate partner at this point. Are we Dan or John? I know we're not on the conductor side, I don't know about the dispatcher side.

DAN OR JOHN: ... [inaudible]

MR. BURTON: He said it depends on the craft and the training resources required.

Q: Once a student's completed the 14 weeks, how much time do they need as far as on-the-job training when they go into the dispatching center?

GARY: They come in for the 14 weeks, which is an unpaid, no-job-guaranteed situation. Then once they finish there, depending on who picks them up, and of course most of them do go to Burlington Northern, although there's that option, Burlington Northern then puts them through a 10-week OJT, which might be in 10 weeks, or it might be strung a little bit longer, depending on what they have to do in their actual training days versus their work days.

MR. BURTON: Thank you all for your attention, especially after lunch.

[Applause]

## **Panel Discussion: Training Approaches for Shortline and Regional Railroads**

Jack Drouin, Vice President of Transportation NY & PA, Genesee and Wyoming

James Ford, Manager, Crew Development and Performance, Belt Railway of Chicago

James Seeberger, Director of Transportation Services, Alaska Railroad

Robert Dalum, Chief Train Dispatcher, Wisconsin Central, Ltd.

Moderator: Susan Madigan, Principal, Transit Safety Management

MR. RASLEAR Thank you, Andy. We are now going to hear from a panel of speakers who are going to discuss training approaches to shortline and regional railroads.



Susan Madigan will moderate the panel and introduce each of the panelists. Susan is founder and principal of Transit Safety Management, a railroad operations consulting firm. Susan has 20 years of training and experience in commuter and freight railroad operations.

Susan started her railroad career as clerk for the Boston and Maine in 1978. After working as a bridge tender and tower operator, Susan became a train dispatcher in 1981. Susan worked as a train dispatcher and chief train dispatcher from 1981 to 1986. She then served as supervisor of operations for Amtrak with responsibility for all terminal activities at North Station, the railroad terminal for the Boston offsite commuter rail service.

In 1990, Susan became an operating practices safety inspector for FRA, where she worked until 1993, prior to starting to her consulting firm. Susan is also a certified operation lifesaver presenter.

The panelists, if you would please go to the front table, and I'm going to remove my materials from there so that you have room and we can start this panel.

MS. MADIGAN: Welcome to the panel discussion on training approaches for shortline and regional railroads. Yes, I feel like this is a panel of recovery of train dispatchers: My name's Susan, I'm a recovering train dispatcher. [Laughter] Obviously, I haven't recovered that much. Somebody called me last week at my office, and I still pick up the phone occasionally and say, "train dispatcher." Or I'll even have a dream every once in a while -- I'm probably oversharing here -- a dream that some cruel chief dispatcher is telling me to work a desk that I've never seen before or qualified on. I'm sure that's based on my experience as a train dispatcher.

That's why this panel was of particular interest to me, because I came from the Boston and Maine, a small railroad and I'd like to hear some of what these other guys from the smaller railroads have to say about training.

You already heard about the approaches some of the bigger railroads have taken and seen some of these Star Wars-type dispatching systems, and so now we're going to hear the perspective from the shortlines and regionals. I'm sure we'll hear about the differences, but I'm sure there'll also be a common thread that's running through the same issues and training problems and challenges that are facing everybody. The one that we keep hearing over and over again is the recruitment, selection, and retention of train dispatchers, keeping your train dispatchers once you've got them all trained and to your liking.

Other challenges are the increased territories that you see as a result of consolidations and such, the increased and especially the different responsibilities, especially for a smaller railroad where you're not so specialized. I know when I was a dispatcher, you also were a yard clerk, a yardmaster, depending upon what kind of field support there was, which was increasingly little.

I think we'll hear from these guys, their unique viewpoint. They're in the trenches every day dealing with these challenges. These gentlemen on my left represent a geographical territory from the Northeast, to Canada, to Alaska, and they have, collectively, over a century of railroading experience, and with me added in the mix well over a century.

Each panelist will give you a brief presentation and then we'll open it up to the floor for questions.

To my left is Jim Seeberger; he'll give you his presentation first. He's with the Alaska Railroad Corporation. He's the director of transportation services, and before that

he was an FRA hazmat inspector, and prior to that he has 15 years with the BN as a dispatcher, and he told me last night that he started off with the BN as something called a telegrapher.

So currently, Jim is responsible for the Alaska Railroad operating rules and practices program and he also is responsible for the hazmat regulatory compliance.

Next is Mr. Bob Dalum. Bob is currently with the Wisconsin Central, and he started out in '77; he has over 20 years experience also. He started off with the Sioux Line Railroad as a train order operator, and then started as a dispatcher a year after that. Wisconsin Central bought the Lake States division of the Sioux line, so that's who he works for right now. He is now the chief dispatcher for the Wisconsin Central.

Next is Jack Drouin, and Jack is from a family of train dispatchers. His father was a dispatcher, his brother is currently a dispatcher for Conrail out of Selkirk. He started with Lehigh Valley 25 years ago as a dispatcher, and then he went to the D&H, then Wisconsin Southern, Buffalo. He now works for the Genesee & Wyoming. It's a holding company for about 21 different shortline railroads. He is now the VP of transportation for the New York and Pennsylvania region.

Wrapping it up is hometown boy, Jim Ford. He's also from a railroad family. He began with the CN&W 30 years ago, and he also worked his way through the ranks. He worked as a brakeman, conductor, yardmaster, trainmaster, and then he went with the Wisconsin Central. He was involved in the start up of the WC, where he worked as a train master and a superintendent. Then in '94, Jim became the manager of rules and operating practices/crew development and performance for the Belt Railway of Chicago. He is currently the president of the Chicago Operating Rules Association.

So I will turn it over to this esteemed panel.

MR. SEEBERGER: We were asked to talk about training approaches on shortline and regional railroads, and having been with the Alaska Railroad, I don't know exactly why I'm here. We have not hired a train dispatcher in about 11 years. Unfortunately, the average age of these fellows is getting up there. We don't know for sure what's going to happen in a short period of time.

We're in a transitional state right now. We had, up until last year, just dispatched with a train sheet and a track warrant book and we have begun to make the transition to a computer-aided dispatching system. We have to get off track car lineups. We authorize ... train occupancy on a main track with track car lineups.

We're required to get off that or to come up with another method of track occupancy and we are not sure what's going to happen to our workforce, if we're going to have to increase it or if we're going to be able to continue on with the number that we have.

We have a training program in place on the Alaska Railroad. It consists of three weeks of classroom training, two weeks of field training, six weeks of training back into the dispatcher's office, and one week of testing. So it's about a three-month long period of training for these dispatchers.

The one class that we have had recently, and it was two years ago, we had kind of a high attrition rate; we had zero people complete the class. We started with four and two of the people dropped out midway during the training program, but the other two, I think, they just wiped their forehead as they failed the final exam and left the door and said, "That's not what I wanted to do." I don't believe that their heart was truly in that particular place.

I think the most important part of the training program that we have in the Alaska Railroad is a selection of the candidates, and believe me, the training program that we

have, or that I came down here with today is certainly going to change because of many of the things I saw presented here this morning.

But the selection process has to be the most important part of our training program. We're going to begin a search for train dispatchers in the very near future. We want to have a class of train dispatchers. That's one part of the dispatcher training problem.

I look at it as being a two-pronged animal. First, we have the training program and we will get them-- let's say we have a very successful training class and everybody passes the test and is qualified to be a train dispatcher. I have one set of trick dispatchers and I have a two-person guaranteed extra board. My biggest problem is what am I going to do with these people when they're not going to be working as a train dispatcher, or if I'm able to continue on without adding dispatchers to the workforce or another desk, what will I do with these people.

Through the loss of operators, we don't have an extra board society anymore. You have clerks that have very specialized jobs, you have payroll technicians, or whatever, that may decide they want to become a train dispatcher, and if I have a three-day vacancy, let's face it, everybody wants their paycheck on time. It's going to be real hard to replace these people.

I think it's going to be one of our biggest problems on the Alaska Railroad.

Something else that's going to happen is the computer-aided dispatching system, people look at that differently. I've seen some people who feel that's going to reduce the required training. I look at it as other than reducing the required training it's going to add another dimension to training. I think the train dispatcher will have to be able to do everything he or she does today, but they're going to have one more skill. They're going to have to be able to do it on a computer-aided dispatching system. If you should happen

to lose a computer or lose the power, or something like this, they're going to still have to be able to pick it up.

These are the problems that I see on the Alaska Railroad, and we don't have a specific plan set up. We just have the 12-week training program, and as I said, again, that will certainly change after some of the things I've been exposed to here today.

MR. DALUM: I'm Bob Dalum from Wisconsin Central Railroad. Those of you who have not heard of us, we are probably, I believe still, the largest regional carrier in the United States with 2,300 miles of track. That includes 300 miles of CTC and automatic block system. We have 28 train dispatchers that handle approximately 110 trains per day.

We do not have a formalized training program. We are in the works of trying to develop one. That is one of the reasons why I'm here, and some other people that I'm associated with are here.

We are a high density, low capacity line. We need to move trains. We need to keep moving trains. We can't afford to have trains slowed down or stopped. We can jam up in a hurry.

So with that, our dispatchers' responsibilities are numerous. We do some clerical on some of our outlying lines, maintenance of way people, movement of track machinery, maintenance of way people and whatnot have all entered in over the years and it seems like it's progressed faster than we can keep up with the technology that's available to us.

One of the big issues on our railroad is communications and our train dispatchers are all experienced. We've done some inhouse training which has worked for the most part. We've had some train dispatchers that have not made it, but basically it's on-the-job training. We do have about a week's worth of rules, but most of the people we have to draw from, it's like anybody else in the industry, now it's from the train and engine

service. We have not hired any clerical people as far as train dispatching. I would say in the past ten years, 70 percent of the dispatchers we've hired have been experienced dispatchers from other railroads.

Our training has not had to involve a formalized program, but the well is kind of running dry now and we need to look at that, as all railroads do.

Communications, as I said, is a big problem with our railroad. I stress to all our dispatchers that there needs to be a focus on how clearly you issue instructions, making sure you and the people in the field are one on one. I think that's one thing that should be stressed as far as training programs. They have to be on one page with the people in the field, and must have a clear and concise plan that each one understands.

We've had trouble with that in the past with maintenance of way people, which Jim alluded to. We've also gotten away from track car lineups, track warrant control system for most of our maintenance of way and track and time are protected. Much more safe, but also more communication is had. The airways are filled; the dispatcher fights for air time all the time, and we need to look for people who have patience and that can remain focused.

We have trains that hop right over multiple territories, as far as train dispatching. Also, the communication between the train dispatchers is very stressed.

As I said, all these things have come about as the industry has grown, more regulations, on-track safety has put more responsibility into the train dispatcher, and these things need to be stressed, even with experienced train dispatchers to be brought in, more schooling and make sure everyone's on the same page.

I guess we have done some things to help the train dispatcher. I know we are right now working with PTSI as far as track bulletins, track protection, a smart bulletin as they're calling it, to assist the train dispatcher, and also the train crews.

Our company is directed, in the first part of next year, to have centralized crew calling, take some of that workload off the dispatcher so they can do their job more efficiently and be focused just on train dispatching and planning.

So all these things add up. As far as training and whatnot, on-the-job training, our dispatchers are required to-- It gets to be quite complicated, and I know we've had people from our larger railroads come and it's a tough industry and it's a tough place to work as far as a regional railroad.

MR. DROUIN: Good afternoon, I'm Jack Drouin with the Genesee & Wyoming Company. It's a parent company that operates shortlines in North America. We have three roads in Canada, four regions in the US. We operate a road in Mexico, and last year we started up a line in Australia, and we're looking all over the world for opportunities.

Where I'm from is the New York/Pennsylvania region. We have a half-dozen or so shortlines, and they are more shortlines in the traditional sense in that the people on the shortlines, the employees, perform many tasks. One thing the dispatchers have in common, of course, is the dispatching side of it. But they also do clerical work, agency work, yardmastering, crew calling.

So when training that individual comes around, it's more than the train dispatching function itself. The training of that individual carries across different job descriptions. He has to know all the labor agreements, not just the agreement that he's covered by. And, in our case, in the New York/Pennsylvania region, seeing there are quite a few railroads within that region, he has to know, or she has to know, the labor agreements pertaining to all those roads. So there's an awful lot of training.

When I started dispatching, training consisted of somebody handing me a rulebook and a timetable and said, "Here, go write a couple trains and then sit with Joe



for a couple of months and he'll tell you how to do the job." Glad to see things have changed a bit. We now have a train dispatching training module, I saw earlier today, that really gives a very good outline as to how to approach train dispatching training, an excellent tool, something I was looking forward to getting my hands on, because we're going to be doing some training, I think, in the near future.

When you do send dispatchers out for training, on-the-job training, for example, a few things you should be aware of and always keep in mind, the person you have your trainee sitting with, that dispatcher is a product of his training, and, added to that, the years of his experience. I've sat with dispatchers; some were very good and some were very bad.

I sat with one guy who was extremely nervous, and every time I cleared a signal or made an entry on the sheet, he would assure me that was a good thing or a bad thing. I sat with one guy, a very dry individual, who one time looked at me and said, "Jack, you cleared a train about 10 or 15 minutes ago and I wouldn't have done it, and if you don't fix the problem in about five minutes, you're going to have a terrible traffic jam and a real mess." I said, "What's the solution, how do I fix it?" He said, "Well, I never made that mistake, so I never even thought about the answer." [Laughter] So I sweat for a little while and figured it out.

Again, when you put people out on trains, you put your trainees out in the road, either on a high rail or on a train, think about where you're putting them. I was once sent out to ride a yard job and for eight-and-a-half hours we sat on that locomotive going up and down the yard lead over and over again, and the only thing I learned from that experience is I didn't want to be an engineer. [Laughter]

So maximize the opportunities you have when you send trainees out, either on trains or high rails, or in our case we don't get a big bang for the buck when we send somebody riding a train where there's absolutely nothing to see, there's no customers

involved, and in the shortline business you're actively involved in either originating or terminating traffic. The things we want our dispatchers to see are the facilities, the terminals, the customers.

So quite often, we'll put our dispatcher trainees, or any other trainees, in a car with a qualified employee and they'll go visit the different sites, versus riding up and down the track.

The one thing the shortlines have in common is they're all different. There are no two alike. One region has no dispatcher in Genesee & Wyoming, because their trains operate on trackage rights.

The region I'm in has a dispatcher who is in a more traditional class one type of environment, where he controls the movements of the trains and that's pretty much all he does. There are other dispatchers in between that do some of the clerical work and the agency work.

But the one thing we always need to do is give them the best tools we can. Shortline railroads don't have the resources that the big class ones do, they don't have a manager of operating rules, per se, and they don't have a training manager, but what we have are great class one neighbors, and so we rely on our class one people to share a good operating rulebook, ideas on how to develop timetable, emergency response guides, calling lists, all these other things that we knock on your door and borrow are greatly appreciated.

Some of the other functions that the dispatcher in the shortline will do is related with today's technology in moving cars in the system, interchanging cars between railroads, placing, releasing, constructive placing, all those functions that were traditional clerical or agency work is being done or could be done by a shortline dispatcher. The training process for that is quite a bit longer.

When you think about the dispatcher and just how important of an employee that person really is, the mood of the dispatcher and the efficiency of that dispatcher reflects in the mood of the railroad. There's neighbors that I have to sometimes call and find out where our trains are, and I just cringe when I dial that number because I know there's going to be a real ugly guy at the end of that phone and he is not going to be in any good mood to hear me asking about my trains. I feel like the president pushing the button to launch the missiles because I know there's a terrible mess at the other end of that phone when I call.

Bear in mind, for those of you who get out in the field, you will see it. If your dispatcher is in an ugly mood and a very hard guy to get along with, your operation's going to reflect it, you're going to see that your trains are going to be operated by people who aren't too happy, too.

So the one thing in training that I would strongly suggest and I heard a little bit about in the community college approach is people skills. I would really strongly suggest, along with all the technical training, you train your dispatchers to be the best communicators you can possibly make them, to be as user friendly as you can, because it's going to be a win/win situation. The better they are at communicating with your fellow employees, the better the railroad will operate.

Any question afterwards, please give me a call. Thank you.

MR. FORD: Hi, I'm Jim Ford with the Belt Railway Company of Chicago, and I have to admit I'm the only one on the panel that actually has never been a train dispatcher, other than a—(end of tape)

MR. FORD: --because the Belt Railway Company is the largest terminal railroad in the country and we happen to be considered a shortline, and last year we humped slightly over a million cars and handled another million over our track, on through

moves, our dispatchers obviously are a lot busier than the traditional shortline dispatcher. Matter of fact, we estimate our dispatchers handled about 250 train movements a day, one dispatcher, three each trick.

I grabbed the train sheet last week from September 11th of this year, we had 227 train movements in one 24-hour period, not counting any of the 25 to 30 times a day the dispatcher has to give someone head room.

We've hired two dispatchers in the last ten years, that I know of in my almost five years at the Belt. They came from the clerical ranks. Our youngest dispatcher's approximately 35; our oldest, the chief, is probably going to retire in another year and any range of seniority anywhere from 10, 15 years would probably be the youngest person we have.

We do not have a traditional train dispatcher's program, other than on-the-job training after the qualified book of rules, but last year we purchased, through PTSI, their interactive instructional system, IRIS system. You've got some of the literature from Mr. Wyman that he passed out.

It's a computer-based program where we have filmed our main tracks, put it in the computer. As a rules instructor, you can turn on the computer, you're running down the railroad, you see the railroad, the instructor can build in questions through the entire process. So when a student sits down and is seeing the physical characteristics of the railroad, as the train is moving, all of a sudden it'll stop and a question will come up on the screen, "What is the name of the center locking?" "What is the name of this road crossing?" Typical physical characteristics questions.

We're going to use this both for our engineers, all the foreign crews that operate on our property, because obviously a lot of them do, and also for our train dispatchers. We're not going to say that this is going to be all they have to have for physical

characteristics training. Obviously we want them to ride trains, ride engines, ride jobs, high rail if we have to, but it's certainly a tool.

Plus, you can use it as a test situation, and that's what we'll use it for, also, on our engineers.

One of the other things he passed out with that was what we term the linear timetable, which is more or less a supplement to our normal timetable, and it came from the filming of the railroad. We were able to take the film and our track charts and you've got an absolute perfect layout of the railroad with all the accompanying switches, road crossings, other railroads. We even have the switch numbers based on our signal department's switch number systems on those sheets.

All our employees have that right now. We have obviously track changes going on all through the summer. I've got changes into the printer now. But it's been a very valuable tool and I've gotten a lot of requests from foreign road crews for that particular linear timetable.

My advice to anyone is that if that interests you, you should talk to Mr. Wyman because he does a good job with it. As president of CORA, we get a lot of feedback on what we've done with the CORA book in the last five years, and I suspect a lot of you have heard about that, what that's done for us, to get through the Chicago terminal.

I'm probably preaching to the choir here, but in case you haven't thought about the Chicago terminal lately, the Chicago rail carriers, which is a general managers and above organization, had an assessment study done of the Chicago terminal in the last-- actually, there's been two done in the last three years, and this most recent one, to try to put some statistics together to use as evidence to add capacity to the terminal and I think what's happening now in the terminal, there's approximately \$120 million being spent this year

on capital improvements in the Chicago terminal, quite a bit of that by CSX, in anticipation of the Conrail split.

Based just on this study and what's happened with the Conrail shift of traffic that will take place after the split, CSX is going to open a command center in Chicago at a neutral site, the B&O CT dispatchers, which is the CSX dispatchers that never went to Jacksonville and never could go to Jacksonville, and matter of fact they sit in our office now next to our train dispatchers on the belt, but they are going to move to this command center, the IHB dispatchers are going to move there also, and the UP is going to put their mop site dispatcher in that building also, we're told.

So CSX's operating plan right now calls for between 130 and 150 trains a day. They'll be operating in and out of Chicago once the split of Conrail takes place.

How that affects Chicago terminal is going to be a great harbinger to what happens to the rest of the terminal dispatchers. Obviously, the harbor dispatchers will be with the B&O dispatchers because they're integrating so many of the track changes that tie in CSX and IHB. What will happen to the belt dispatchers, at one time there was talk that they would all be merged together and start all dispatching the Chicago terminal, integrated in some way, and at this point I don't think that's going to happen.

You also have to remember that out of the over 1,500 trains a day that operate in Chicago, 678 of them are commuter or passenger trains. So our mix is great.

I think that's all I want to mention at this time, and will entertain questions with the group.

MS. MADIGAN: Any questions?

Q: This is for Jim Seeberger. Steve Ditmeyer told me that you were going to be the first railroad facility to adopt a portion of your track with PTC; am I right?

MR. SEEBERGER: That's correct.

Q: How do you see that affecting your dispatchers and how are you planning to train them to deal with it?

MR. SEEBERGER: Currently, we're in the development stages. We're working with GE Harris. GE Harris is building a computer-aided dispatching system for us. That's truly phase one of a four-phase program. Phase two was the digital microwave system, which we have finished phase two, actually, before phase one is done.

Phase three is going to be the location; we'll be able to locate our locomotives and equipment. And phase four is going to be enforcement, and that'll give us a PTC system when that's completed.

We have a really unique situation that makes the Alaska Railroad a great place to try this. The word interoperability is not in our vocabulary at all. If I'm going to get a piece of equipment on the Alaska Railroad, I will know seven days beforehand, because that's when it's going to be on the water. It has to come up, we have no rail line connection. So nothing can sneak out there, where it could with just about every other carrier, I believe, that's represented here today.

To be perfectly honest, we don't know what the system is going to be like at this particular time. Certainly the dispatchers will be in on the training. We're truly using the dispatchers to develop the CAD system that GE Harris is putting together for us. We've managed to have them involved in every aspect of the concept of operations to put together the paper that's going to dictate what the system's going to be like.

Q: Mr. Seeberger, you say it's been 11 years since you hired any dispatchers on the Alaskan?

MR. SEEBERGER: The youngest train dispatcher has 11 years service as a train dispatcher on the Alaska Railroad. We have one dispatcher that has less time as a dispatcher on the Alaska Railroad, but he came from outside and wanted to hunt and fish,

and so he loves it up there, and he came up to Alaska and we were able to find him. But yes, that's correct.

Q: You don't promote them to other positions, you just hang on to them once you get them in there?

MR. SEEBERGER: We have two other dispatchers that are promoted. One is manager of operational resources, which anyplace else would call chief dispatcher, and the other position is our manager of operating rules, and both of those individuals are also train dispatchers.

Q: I have a question for the four of you: What do you all find is the greatest challenge in the next couple years as you start having to train new dispatchers potentially off the streets? We've heard a little about what the class ones are concerned about and we'll hear more later, but for the shortline and regionals, what do you all find will be the greatest challenge or challenges?

MR. SEEBERGER: On the Alaska Railroad, I see one of my greatest challenges is going to be the selection. I've said that before. The selection is the most important part of the process. Many people in here this morning have talked about having train dispatchers come from the ranks of train and engine people, because they have a really diverse background. I concur with that somewhat, but whenever I run a train, there's going to be a dispatcher, there's going to be a conductor, and there's going to be at least an engineer involved in that movement. There will be at least three people involved with that.

If a track car operator decides he wants to get out on to the track, there can be one person involved with that. So as far as rules compliance, I look at track car operators and I think they have less room for error. They don't have anybody else out there possibly to discuss this with. Roadway worker protection is changing this somewhat, but it's still we



have to give them the credit that's their due. They get out there by themselves and begin to do that.

It's hard for me to encourage a train or engineman that has the potential of earning 70, \$80,000 a year to come into a dispatcher's office where you have a capped salary. You've got more stringent hours of service. A person has to be dedicated to not being on the road or being away from home before they're going to accept service in a train dispatcher's office.

So I feel we're going to get our people from the ranks of clerks. And again, the clerks don't have an extra board, and it's going to be very difficult for me to fill in behind. If I have a clerk that wants to be a train dispatcher, and I use the example of the payroll clerk. Everybody wants to get paid, and if they're dispatching trains, they may not be able to fill behind them since we don't have an extra board for some of those.

MR. DALUM: In our case, on the Wisconsin Central, we are a regional railroad, but much like a class one I foresee-- like I've said previously, we have done hiring within the train and engine class. Jim makes a good point, the maintenance of way, and I've looked at maintenance of way people. I think they are in the future for us also, and we at Wisconsin Central like to hire within and keep people and promote people within and if we can continue to do that, that is the course we'd like to take.

Our last resort would be to hire people off the street, but I foresee us with a training program, hopefully in a couple years, where we can develop people throughout the system and we do have a guaranteed extra board that we use people for dispatching and getting our regular dispatchers out in the field also, and also promoting train dispatchers.

We have an operations center that draws from our dispatching core, so we're continually hiring and promoting people from within. That's our future.

MR. DROUIN: In the more traditional shortline environment, the train dispatcher, because he's doing so many different jobs, besides dispatching, to take somebody right off the street would mean not only teaching him how to be a dispatcher, but how to be a clerk, how to call crews, how to do the data entries, and all the other jobs that are typical of a shortline dispatcher. So off the street usually doesn't work very well for that shortline dispatcher.

However, we can draw from a limited amount of clerk positions, if there are dedicated clerk positions, or more than likely the train and engine service ranks. When you have to choose between a trainman, conductor, or engineer, because we need to look at costs so closely, it's a tough bite to actually go and take an engineer and make him a dispatcher because we've invested a lot of money in training that individual as an engineer.

So the ideal candidate for our shortlines turn out to be the conductors, the trainmen, because they're the ones that are going to be taking that knowledge of how they switch an industry, how they switch a customer and bring that into the dispatching office. That's a very good thing to have, because then the dispatcher can better make his judgments when he's issuing authorities for how long it takes a train to switch at a particular facility, for example. If he's done that work himself, he knows much more accurately how much time he should allot for that actual job. A clerk wouldn't have that advantage.

To be honest, I never thought of maintenance of way, but I have to think about that some time. I don't know if they've done any trainwork either.

So for the shortline, that's really where it comes from, the trainmen ranks, if at all possible, and the last thing I think we're going to be doing is taking some of it off the street. We just don't have the time and resources to do that kind of training.

MR. FORD: I agree with Jack, because we probably would not want to hire someone off the street to be a train dispatcher. We'd have to look inward. A plus for us, obviously, is our location because we're here in Chicago, and being the railroad hub that it is, we have some extra sources that we may find one.

As a matter of fact, I probably failed to mention earlier that we did actually hire one other dispatcher in the last three years, and that was a Sante Fe dispatcher who did not want to move to Fort Worth, a native Chicagoan who didn't want to leave town, and we were able to hire him, and he's our extra board dispatcher.

Otherwise, we'd probably have to go with the train and engineer ranks most likely. And I think last year, '97, we had over 28 employees who made over \$100,000. So that money becomes an issue. I'm not sure any dispatcher would even come close to that.

Q: I represent Rail Tech's railroads, and I heard a description of part of our operation I think from every one of you, because we operate about 31 shortlines, total of close to 4,000 miles of track in the US, Canada, Mexico. We're partners in about 7,000 miles in Brazil and one in Kazakhstan.

I think over all of our properties, we have about half of our railroads that actually use dispatching; the other half are all yard limits or some other type of operation. Probably around 35 dispatchers. We generally hire about five a year. About 50 percent of those are previously experienced dispatchers, 50 percent of them off the street.

We have, over the last three or four years, taken several from the ranks of train and engine service, and every single one of those that went from train and engine service to dispatching have gone back to train and engine service. They don't find dispatching to be the leisurely job that they thought it was. [Laughter]

Another problem that we find very specific to our type of operation, because all of our railroads are operated independently of one another, with the exception of some administrative duties that come out of our central office and safety and operating practices management, which comes from me and one other person from the San Antonio office.

But since all the railroads are diverse in the way they operate and under an individual general manager, we find it a very difficult time in using an appropriate use for all of our resources, money and time, and getting all of those people into a central area for training.

I was wondering, from each one of you, what is your perspective on the proper or most appropriate use of time and money in training? I heard some of you say you don't hire more than one in five years, or one in two or three years. How can you justify a training program for that few in number of people?

MR. DROUIN: For those roads in Genesee & Wyoming, we certainly count on other people to develop those training programs for us. We'll beg, borrow, and steal from anyone who's gone out there and reinvented it first. Then when it comes time to do any particular training, we look around and see who's the more qualified person available to perform that training, and then we'll take whatever material we've acquired from other roads, put it together with the trainee and do the best we can.

I think the training has come a long way since what we had just 20, 25 years ago. So we're on the right path.

For our end of the industry, we just don't do it that often, so it's always a learning experience, not only for the trainee, I'm sure, but for the trainer and anybody else involved in it.

MR. FORD: One thing about the Belt Railway is we are owned by the eight largest railroads in the country, so we can call on our owners sometimes to help us with some of our problems, and they naturally are always willing to do that.

But it does become a problem because how do you train one dispatcher, where do you send them. I end up with them one-on-one in rules and then the OJT, and now we've got the IRIS system which will help on the physical characteristics.

Luckily, again, for where we're located, because we do have a working relationship with the Illinois Institute of Technology and with the simulators that they have at their property, a lot of that's available to us obviously, without leaving town.

But we've been called many times by some of the contractors out there, come to Kansas City, come to St. Louis, and it becomes a problem with money, and how many people you can actually send down there. So it is an issue, and I don't know how you come up with any one simplistic answer.

MR. DALUM: Well, I foresee something as a trainer right out of the dispatching office; in our case, have train the trainer type thing in conjunction with our training center that we have on the Wisconsin Central already in place. This train dispatcher would have the additional duty of being a trainer, he would handle the rules for the train dispatchers, rules classes, and also when we need him to administer the train dispatcher program. I think that would be the best way for your buck as far as having the men right in the office and teach them the way the office operates.

MR. SEEBERGER: I don't know if I can justly answer your question, but if I don't hire some train dispatchers pretty quick, I'm going to be in a world of hurt, I won't be able to move a darn thing. As obnoxious as train dispatchers can be, you don't want to have too many of them, but you can't live without them. [Laughter]

Q: I'm turning this question to the audience to see if there are any things out there that you would suggest to these four folks -- I know there are some representatives from other shortlines and regionals out there -- based on your training programs that you found, maybe lessons learned. We've already heard one, that trainmen may not work out as dispatchers, but do you all have any other suggestions?

MR. WATKINS: I'm Jim Watkins from Montana RailLink, and we've run into a lot of the same problems with our train dispatcher candidates. One thing that we did is we, the last class, we asked the switchmen-- we've got switchmen in this last class, and three people from the track, and one person off the street. We asked this last class to give us a seven-year commitment. We've lost all the engineers, switchmen, the type that we've had before, they've all quit, gone back to make more money, and probably work a better job.

So this last class, we asked them to give us a seven-year commitment, and we think that probably after about five years we should be making some money off of them. They'll be good dispatchers by then and maybe they'll make the decision that this is really where they want to be.

I think you have a tendency after the first one or two years of dispatching to give up, because it is very tough the first couple years.

MR. SEEBERGER: I have a question of you, Jim. What are you going to do them if you they don't give you the seven-year commitment?

MR. WATKINS: Well, there's going to probably be cases where it's not going to work out, so if it's not working for us and it's not working for them, obviously we're going to have to let them go back. But at least coming in, they know what their commitment is. We've talked to them about it, and the union has written an agreement for this, the union's behind us on it.

It's something new. We're trying it and going to see how it works.

Another thing, we're having the same problem trying to find good candidates, and something that we're considering is looking at college graduates, because we can offer a pretty good wage. We start out at \$36,000 a year, and it goes up rather quickly, and that's a pretty good starting wage for a college graduate, and they can look at being probably at \$45,000 I think after two or three years.

Q: I have one comment, I think Mr. Seeberger mentioned you don't want to have too many train dispatchers. I think most people here, the reason we're here is nobody's got too many; we don't have enough. I'm with Amtrak in New York, and I know my counterparts in Boston and Philadelphia, we're all short people. And one of the reasons that we're short is we keep promoting.

You can always do something with a train dispatcher. I just did a quick head count; on my division alone there's 15 managers that came from the train dispatching ranks, so you can always find, whether it be training or special duty or whatever, you can always find something to do with a train dispatcher. If you don't have enough, you're in trouble.

MR. SEEBERGER: If you get good candidates, and when you don't have an operators' ranks to draw from, sometimes we overlook people that would be good dispatcher candidates because they can't afford to give them up in another place that they're working. I think that we're seeing that; I've seen two vice presidents just almost come to words over particular people, "I want to have that person in my training class," and the other one says, "I don't want to give that person up," and the person is the one who suffers if they're so good at what they do they're not eligible for a promotion.

Q: Efficiency testing for train dispatchers, especially on small railroads, I never saw it, thank goodness, when I was a dispatcher, because I don't know if I would have

survived, but do you ever use your efficiency testing programs to pinpoint where your training deficiencies might be or where you might need to do some retraining? Do you have efficiency testing programs?

MR. SEEBERGER: That's a big part of our discipline program. [Laughter]

MR. \_\_: We have extensive efficiency testing program, and obviously train dispatchers fall into that, and yes, we would target reeducation on failures.

Q: I guess I thinking of something like the BN does with those safety alerts. They come out with, identify what happened and what kind of remedial training can be done to prevent something the next time.

MR. \_\_: We don't really do it as a group as a whole, but we do individual efficiency testing. If a person needs something, something needs to be corrected, we do it on an individual basis, not necessarily on the office as a whole.

MR. \_\_: Most efficiency test programs, though, are dealing with operating rules and something that can be codified. I think one of the main thrusts of this whole experience today has been that we're looking for more qualitative instructional tools, communications skills. You can't quantify a communications skill on what we call an 1872 or an efficiency test, unless there's an operating rule involved.

So to that extent, your test program will not aid you, if you're looking for a qualitative improvement.

MR. SAMPSON: On the Raitex properties about two months ago, we just put into place a new efficiency testing program that puts a primary emphasis on identifying areas that need to be handled in remedial training. We also have on our properties, and have had since its beginning 20 years ago, what we call a SERTIFI, which is a simulated emergency response to infrequent incidents. Through the use of those programs, we also



identify areas that we need to do remedial training, and dispatchers figure heavily into both of those programs.

Q: We've come up with efficiency testings for performance and we see a minimum standard for train dispatcher and every train dispatcher falls into that category, it's not random, and they must operate a standard set by the company, and if they don't attain that level, we don't disqualify them, but we kind of coach them and we get safety partners to coach the people up to the company standard in that case and they're allowed to go up through that part. It has proved quite successful in certain areas where we've done.

I guess the only part that maybe doesn't is some of the managers have said regarding meets it's something that is not rules-related. Most of these efficiency testings are rules-related and certainly sometimes there are other aspects of a train dispatcher's job that should be done properly -- delaying trains, don't know where to make meets, and that sort of thing.

So that's probably one of the deficiencies in our efficiency tests that we do. But as far as moving them up to standard, if we're operating rule applications, it's been very successful.

MS. MADIGAN: Thank you very much. [Applause]

## **Training for Air Traffic Controllers**

Henry Mogilka, Air Traffic Training Specialist, FAA Academy

MR. RASLEAR Thank you very much to the panel for sharing with us, and for those of you who asked questions and answered questions, thank you for sharing also with us.

One of the things I came away with from that is that there's probably some need being felt for aid in selection. That seems to be a very major issue, and I don't know

really if that's something the FRA can promise anybody at this point in time, but it's certainly something that we can look into with regards to dispatchers. It's a kind of a thorny issue, one we've discussed before with regards to locomotive engineers, and certainly worthwhile considering.

The other thought I had about what was discussed in that panel was that it seemed to me that there might be some way in which you can train people for retention, and I don't mean in memory, but to keep them on the job. Perhaps part of that was mentioned in Jim McQueen's, lifestyle training, giving people an idea of what it is that's going to be involved in their job is included in that objective that the Foster-Miller folks put together. It not only applies to having to work perhaps a third shift or working different shifts at different times, but also coping with stress, and certainly it's my understanding that the dispatcher job involves a lot of stress and uneven workload, and things of that sort.

If you have a training program and you're bringing new people into the job and they don't understand that this is part of what they're getting into, it pays to educate them about that, and then also give them some strategies for coping with it.

So for what it's worth, those are two thoughts that occurred to me during that panel discussion.

We're a little ahead of schedule, but since we're all here and we're not expecting anybody else to show up, we will move ahead.

Up to now, we've specifically talked about training for train dispatchers; now we're going to have a slight change. We're going to hear from Henry Mogilka. Henry is an air traffic training specialist with the Federal Aviation Administration. Henry has worked for the FAA since 1983. He worked as an en-route air traffic controller from 1983 to 1992; then he moved to the FAA Academy in Oklahoma City, where he worked as an air traffic controller instructor.

Over the last two years, Henry has been involved in developing air traffic controller performance measures to validate a computerized selection test that will be used to hire new air traffic controllers.

He is also currently working on a research project to establish an English language proficiency standard for foreign air traffic controllers.

The topic of his talk is training for air traffic controllers, and if he could, I hope he says something to us about selection as well.

I give you Henry Mogilka. [Applause]

HENRY MOGILKA: Good afternoon. I can tell you one thing, I'm not sure I want to be a dispatcher; no one takes a break around here! [Laughter] If we had a group of air traffic controllers in here, they'd be on strike, I think. [Laughter]

Are there any other air traffic controllers in the room? Good, a captive audience, then.

When I was asked to make a presentation to you all, I wasn't sure if they were going to hold me up as a model to follow or a pitfall to avoid, so hopefully we can maybe get some good information out to you.

What I'm going to talk about for the half-hour that I have is selection of controllers, different types of controllers, what an en-route facility does, some duties of an en-route air traffic controller, our training, and a few training considerations that we use at the FAA.

Selection. Currently we have an age requirement to be an air traffic controller. You have to be 30 years or younger prior to being hired. You can have a four-year degree, or in place of that four-year degree you can have an equivalent amount of work experience. The college degree can be in any topic, does not have to be related to air traffic at all.

The aptitude test that I was involved with in developing, we just finished it; in fact, the report is due today, October 1st. It's going to be a large report. It's a six-and-a-half-hour computerized test battery that we've used on over 1,000 controllers to validate, as well as five to six hundred what we would call pseudo-applicants, in order to validate that test.

I don't know if you all remember, in 1981 most of the air traffic controllers went on strike. Unfortunately for them, they were let go. Fortunately for me, since I was hired in 1983, I was hired. That large group of hires that we've had since 1981 is going to be retiring in the next three to five years, and as you will see a little bit later, it takes about two-and-a-half to three years of training to train an air traffic controller.

So right now, the FAA is going to be faced with the problem of having to fill the pipeline back up with developmentals or trainees in order to meet that attrition rate that we expect to occur within the next three or four years.

We have several programs that we're going to use that we get our trainees from. One source is the military. The military isn't real great on us trying to get their controllers because they spend a lot of money and time training their controllers, and they'd like to retain them, and when they see the salaries that they can make in the FAA, a lot of them like to just serve their four-year tour and then try and get hired by the FAA.

So we'll probably hire some, but we're not real active in recruiting from that source.

Another source is the controllers that were fired in 1981. The Clinton Administration lifted the ban on hiring those controllers. Right now in the Academy we have a class of controllers that were fired in 1981. Some of them have been working in foreign countries, others probably haven't been controlling traffic since they were fired.

So that's another source for our hires.

A third source is what we call a CTI program, or a college training initiative program. What that is is colleges that we make agreements with develop or actually instruct on basic air traffic control. The curriculum that they use is developed by us at the FAA academy, in conjunction with an associate's degree, and usually in aviation management or aviation science.

Then our fourth source is off the street, just someone who has no aviation background experience whatsoever, and gets hired off the street.

We expect our hiring to be three to four hundred a year, starting with this fiscal year.

Types of air traffic controller. There are approximately four types of air traffic controller. The first one is called flight service station controller. This controller issues weather briefings; they file flight plans for general aviation. They do not actually participate in the separation of aircraft, but they have extensive weather background where the general aviation pilot would call in and say, "I'm going to fly from Chicago to Oklahoma City, what's the weather along my route of flight?" Then the flight service station specialist would then look at the data that they have and give them a forecast for their flight.

The tower controller is probably everyone's real familiar with, is the one that you see out in the airport in a tower cabin. Those controllers control the movement of airplanes on the surface of the runway and to the gates.

Approach control are radar controllers that usually work in the basement of that tower, or sometimes it's located in a different building away from the airport itself. Those controllers work within about a 30-mile radius of the airport, up to about 10, 12,000 feet, and they are responsible for as soon as the airplane takes off from the

runaway to control the airplane in its either climb mode or descent mode, until it reaches about 30 miles from the airport.

At that point, then, it's handed off to what's called an en-route controllers, and that's my background. An en-route controller handles the aircraft all the way from 30 miles from its point of departure to about 30 miles from its destination.

There are 22 en-route facilities across the United States. They're on a 24-hour operation. The average, about 40 to 50 control positions in each of the facilities, and those positions are grouped into what's called specialties, so that each specialty has about seven to nine sectors in that specialty. As a controller, if you want to become an FPL, or a journeyman controller, I have to be certified in all seven to nine of those sectors within that specialty.

Each facility has approximately 250 to 400 controllers. Chicago or Cleveland center are usually vying for the number one busiest center in the United States, with over 200,000 aircraft handled in a month, which is a lot of airplanes.

Some of the basic en-route air traffic control duties are flight data, manual control, and radar control.

Flight data. Flight data is basically just information about each individual aircraft that is entered into the computer that concerns the aircraft's type, speed, real flight, altitude. It's entered in a computer. If, for example, a general aviation pilot would like to file a flight plan, they would normally call into the flight service station or they could even call in on frequency for that sector and ask to file a flight plan. I, as a controller, would take all that information in a specified format and input it into the computer.

This is an example of what our flight strips look like. As you can see, call sign, Northwest 196. Type of aircraft, it's an Airbus 320. We have two different kinds of speed that a controller has to worry about -- true air speed and ground speed. The T, 459,

followed by the G, 488. The first one is the true air speed and the second is the ground speed. We have to be concerned about upper winds. So even though an aircraft might file 450 knots, if they have a 100-knot headwind, their ground speed would be reduced to—(end of tape)

MR. MOGILKA: This is a fix and this is a time, Greenwich mean time, sometimes called Zulu time, over a specific point. So this aircraft is at flood level 370 or 37,000 feet, and expected to cross this fix at this time, and here's the aircraft's ... flight, and there's identifiers for different points along the country that this aircraft flies.

The J114 is actually a route that's defined by land-based navigational aids, electronic signals in the sky; sometimes they call it a roadmap in the sky.

As a controller, I have to memorize all the roads in the sky for my airspace.

Lastly, the arrival point, going to Minneapolis, and just some information about what's called a beacon code. It's a type of equipment that's on an airplane that transmits a specific code. Prior to this equipment being on aircraft, if I was separating an aircraft on radar, the only information I would have would be what was on my radar screen, any type of reflection, it would be called a blip that would appear on my radar screen. I would have no idea who that was, I'd just know there was an airplane out there. I would have no idea what altitude the aircraft was at. Use of this equipment, a transponder, gives me aircraft call sign, gives me aircraft altitude.

Manual control. A manual control is basically what's also called radar associate position, or a D-side sometimes you hear that referred to. What that person does is work right next to a radar controller, managing that strip, all those strips. You get 20, 30, 40 strips, sometimes even 50 strips in bays next to the radar screen. Those strips are sequenced according to time and the manual controller tries to formulate a plan for when all these airplanes are going to enter their sector.

Usually you get the strips 30 minutes prior to the aircraft entering your sector, and what the manual controller does is try to formulate some plan, highlight some areas where he or she thinks there's going to be a conflict. If there's incomplete routes of flight, they look at all the flight progress strips to make sure all the information is up to date and accurate.

Here's an example of a two-sector position. This controller right here is what's called the manual controller, and here are all those strips I showed you. They're sequenced according to time. They're usually put under what's called a fixed posting and what this is is a specific geographic point that all these aircraft are going to fly over or near. This controller has access to a computer here to enter flight data, as well as a keyboard, and here are the communication lines so that if that controller needs to coordinate or communicate with an adjacent controller, they have instantaneous communication.

The radar controller obviously is this person right here sitting in front of the radar screen. This controller is the one that actually talks to the aircraft. They also have a communications set up here so that if they need to coordinate something with an adjacent controller, they can do that instantaneously as well.

I think I've talked about radar controller; again, separates aircraft via radio, again within a certain air space. Unlike individual companies, the FAA owns-- I shouldn't say own, but administers for the taxpayers the air space that we have, so that it's really on a first-come-first-serve basis; whoever gets there first gets the use of our services first.

If there's a tie, we actually look to see who departed first and that aircraft gets priority. Usually it doesn't come to that. Usually, for operational reasons you'll either vector aircraft, turn them, or descend them, based on your own traffic needs.



Again, here's a radar controller. This is in our simulator out the FAA Academy in Oklahoma City. As you can see, it looks very similar. It's identical pieces of equipment that's used out in the field.

An instructor; a simulator usually plugs in so they can listen in to everything that's being said, as well if it's an OJT instructor would be in a very similar position as this instructor is. If you look real close, you probably can't see, but that's a contract instructor from the University of Oklahoma.

I'm going to talk about three different types of air traffic control training: Initial training, current training, and remedial training.

Initial training. Prior to our development of this new selection tool, we had a unique way of screening our new hires. We would ask them to submit to an OPM, office of personnel management, written test, and then after that, if they met security clearance as well as a medical clearance, we would send them to the Academy for what's called a three-months screening program. We would give them the basics of air traffic control, aerodynamics, weather, and the basics of non-radar control.

After that point, we would put them in a simulated, non-radar control environment where they would be asked to apply the things that they have learned. We would have instructors that would rate them according to their technical proficiency and what was called an instructor evaluation. That instructor would, I guess, estimate what that person's potential would be to learn the air traffic controller job.

After a series of about seven or eight what we call graded scenarios, they would get a score. There would also be a final written test worth about 20 percent of that student's final grade, and at the end of that three months, if you got a 70 percent, you went on to field training. If you got a 69.9999, they say, "Thank you very much, here's your pink slip and we'll see you."

We're changing that with our new computerized selection test that I talked about. What we hope to achieve with this computer-based battery is upfront selection of the people that we think can make it or have the aptitude to be a controller. Within that six-and-a-half hour time slot, we hope to achieve roughly what used to take three months to do during that screening program.

The screening program had a washout rate of approximately 50 percent, so you can imagine the cost not only in dollars, but just the personal cost of someone who had to give up maybe another job to go for three months to try and be a controller, and at the end of that three months realize that they didn't have a job any longer.

So what we hope to do now with our ATSET, we're changing our mode, shifting our paradigm as my management would say, about going from a screening to more of a training facility where we're going to prepare them for OJT in the field. So when they come out of the Academy, what we hope to do is get them right into radar associate or manual control at their field facility.

Field training takes anywhere from two to three years depending on the type of facility, depending on the back load of other developmentals ahead of them, and depending on if they have OJT instructors. If you don't have enough instructors, trainees sometimes have to wait until an instructor becomes available in order to get trained.

So, if assuming that they had round-the-clock, day-to-day OJT, it probably would take six to seven months on a manual side, and about another six to seven months on the radar side to reach FPL status.

One thing I wanted to mention about our on-the-job training; it's very structured. Every day that we have OJT, it's documented, the students' performance-- and I shouldn't say really students, it's more of an employees' performance, is evaluated and graded every day. It's documented how many hours of training they receive that day, what the traffic

difficulty was for that day, and there's also a checklist for the instructor to go through all the basic duties of an air traffic controller to see if they need improvement in certain areas, if they had met the requirements for that day, and then that's collected every day.

Even before we plug in for an OJT instructor and before the session starts, we have what's called a prebriefing. If I was being an instructor to a student, I would tell that student, "This is what I want you to work on today. I've been working with you, this is what I want you to concentrate on." We would get training that day. If there were no traffic, maybe only one or two aircraft, we would discontinue the OJT training.

The reason is because there's a limit to the number of hours that's allowed; 160 hours of OJT, and if you haven't reached a certain status by that 160 hours, then you're let go. Again, it's an up-or-out policy, still.

We have recurrent training. Again, here's a picture of what it looks like during training, during OJT. After a person reaches an FPL status, they sometimes come back to the Academy for recurrent training. We have courses in quality assurance that we give to our controllers in order to staff or to fill staff positions at each facility. We have a quality assurance office at each facility, we have a training department in each facility, and we have what's called an air space and procedures office in each facility.

Field training. Controllers get refresher courses once a year. They get what's called tape talks. Their supervisors plug in and listen to how they control traffic once every three months to make sure they're adhering to phraseology standards. If there's any deficiencies noted, then they are sometimes referred to remedial training.

Remedial training. For an Academy resident, if you're out in a developmental stage, with our new policy, if there are any deficiencies noted with a trainee, we offer remedial training. We go back. We like to concentrate on what's called part task enterprises, especially for a developmental. Part task exercise means that we take the job

of a controller and break it down into smaller, simpler tasks, provide simulation on those smaller tasks prior to them going into a fullblown simulation where they have to actually use every task that they've learned.

For example, speed control, vectoring, altitude assignment. We have simulation where that's all they're required to do so that they learn each of those parts of the entire task before they go on to the full task.

Field training. Yes, once in a while you'll have an FPL that gets what's called an operational error. That means they get aircraft too close together than the required standard separation. In an en-route environment that's five miles, or 1,000 feet, below 29,000 feet; above 29, it's five miles and 2,000 feet.

Again, here's a typical sector in an en-route environment, usually two people working, again, with all the strips. This third person could either be an OJT instructor, or they also have the capability to be what's called the handoff person, another set of eyes when it gets really busy.

So this would be just a regular FPL controller that would plug into the sector, assist the sector as needed during high traffic periods, and then when the traffic period dies down, they would unplug and go work a different position.

Some training considerations. I have no background in dispatcher, so you kind of have to take what I say; if you can use it, great; if not, that's cool, too.

Centralized versus localized. This is always a problem because we'd like to have centralized training, but yet you'll be amazed at how differently someone does the job at each facility, or maybe you won't be amazed. It's always a tension between the two.

Right now, most of our training that is conducted in the field is generated by the Academy in Oklahoma City. We send out a syllabus, training materials to the field, and

they use those in the classrooms, in the field, and then they supplement for their specific operation in the field. That seems to be working pretty well.

One of the things that we like to do is bring managers of those facilities into the Academy and ask them, "Are there any gaps in the training that you're seeing from your trainees? What can we do to make it more centralized? Are there things that we can do to better prepare the trainees that would fit most of the facilities?"

OJT instructors. This is probably, I think from a student's perspective, one of the most important things, to select proper OJT instructors. In my class, I had a group of 36 when I started at the Academy. We had about 17 that made it through the Academy to my center, which is in Albuquerque, New Mexico. Out of those 17, there were about 12 that finally made it to FPL status.

I know there are one or two that probably could have made it and should have made it had they had a different OJT instructor, and that's really a waste of resources. You've spent so much money on that person, they've spent so much time on that, and it was just a shame to have them not make it and wash it because of poor OJT. It's really critical to get good OJT instructors, instructors that are motivated.

When a new student comes on board, a team of controllers, the supervisor of that team normally makes an assignment for another controller to be that person's instructor. They have daily and weekly reports about that student's progress. It's up to the supervisor, as well as the trainee, to note that they're having any personality conflicts that's preventing training. There always has to be that open line of communication.

If there are, the supervisor should then replace that instructor and really have no hard feelings about that. But I can't stress that enough -- have to have good OJT instructors.

Relevancy. Again, what you're training, you want it to be relevant to what you actually need to do on the job. Again, we use our managers from our facilities who give us input into that, so they tell us what they want their trainees to know.

Evaluation of the training. I think someone mentioned this before. How do we evaluate? How do we do quality assurance? After every course that's done at the Academy, we have an end-of-course critique. We get input from the students as to what they liked, what they didn't like. We have constant communication with our managers in the field to find out whether or not the trainees that they're receiving are prepared or not.

Partnerships. There are several programs. I've been to a couple of foreign countries, and I wanted to talk real briefly about regional partnerships for training. Traveling to other countries where they have very small air traffic staffs, they run into the same problem where they don't have enough money in order to train the few controllers that they need. What these countries do is form a regional school where they pool their resources regionally and provide training and two controllers that then go out into the individual countries to perform air traffic.

Another program that's run through the ICAO, which stands for International Civil Aviation Organization, is called the train air program. In order to belong to this program, you have to submit materials, training materials, course materials, only for one course, according to the train air standard to this-- I'm going to use the term repository. It's a repository of lesson materials, and then each member of the train air program then has access to those materials.

The foreign countries find it very useful; if they provide one course, they have access to 50, 100 different courses where they have up-to-date training materials that can be provided.

I wanted to show you a couple of pictures of our new equipment that we're in the process of replacing all that old equipment. It's called a DSR. This is the new radar screen. It goes from being round to square. I believe that's a Sony 2K monitor, and here is the manual controller's position and here's the flight data position, as well.

Here's a closeup picture of that as well. Again, all the facilities are in the process of installing these. Each of the buildings had to add an entire new wing where these new workstations are being installed. Seattle, I believe, is the first one that's going to go on line. I believe they're in the process of crosstraining at this time. I think they're going to go operational some time early next year.

One of the things I want to show you, I don't know if anybody counted the number of strips in the old system as to how many strips are in this new system. There are obviously fewer in this system than there are in the old system, and there's a very scientific logical reason called "oops." Someone thought that we didn't need all those strips, so right now we're in the process of trying to figure out, well, some facilities actually do need those strips, they do provide manual control.

So what they thought was a standard operating method for one facility turned out not to be. So right now what we're trying to do is develop new ways, have strip reduction projects, to accommodate this piece of equipment, because I think they bought it already at several billion dollars worth, and it's a little bit too late to change it. That might be one of the pitfalls you want to avoid.

I found this and I thought this might be appropriate. Education, maybe as well training, is really not like filling a bucket, but more like lighting a flame, and with that note, I hope you keep the fires burning bright. Thank you. [Applause]

Q: Just a comment and a question. Not buying enough strip controls is sort of like ...a train control system that doesn't work, but we're going to have to make it work. We've all been down that road.

You seem to emphasize the fact about the instructors and the OJT instructors and somewhat of a danger being in there, and I was wondering how you can tolerate an instructor where a student is not going to pass. I was just curious; is that a contractual thing, are they unionized, how does that work?

MR. MOGILKA: When an employee first signs up with the FAA, the program to be an air traffic controller is an up-or-out policy, and it's something that's not really grievable or any kind of lawsuit can be filed because of it. In other words, if you don't make the training, if you don't have the ability to control the airplanes, the government has the right to let you go. That has been challenged and the government has won. Obviously because it's a safety issue, I think the government's probably allowed a little bit more leeway, so that a person, even after a year-and-a-half, does not make the grade, then they can be let go.

Many times what management tries to do is find another position for that person. Obviously since we invested a lot of money in that person, we don't want to lose them.

Q: I bring it up because we've had similar things. We've had what I call trainee/instructor conflict, and being we're invested money in the trainees, we've kind of sat both parties down with training heads and said we want this person to pass, but we want to be cognizant of the instructor's side of it as well.

MR. MOGILKA: One of the things that we really have to do, we have to document so many things. We have to document every day's training so that if we do have a problem, it can be identified early, so that the hours of training aren't used up in ineffective training.



Q: I've heard that in the control tower that they have relief for some of the controllers, that they don't just sit there for eight hours. Is that the case? That they actually get up after 15 minutes or a half-hour and have someone who will jump in the seat for them a little while, a swingman?

MR. MOGILKA: I have to be honest. I was kind of surprised when I heard that dispatchers, when they get assigned to a position, that there's no relief.

Q: This is something that's been talked about in some of the busier offices on and off. I mean, in a busy office, you'll literally see a dispatcher running to the men's or ladies' room or going to get a cup of coffee and running back because they have to punch in a signal or whatever. It's been brought up a number of times, could we get a swingman here to jump in for 15 minutes while I take my time to go to the men's or ladies' room. Is that the case with the controllers?

MR. MOGILKA: Yes. We have in what I call a specialty there are about six or seven sectors within that specialty. There are usually one or two teams of controllers that are assigned to work in that specialty, and when I work in that area, I would go-- the way we used to do it in Albuquerque, I would put my name at the bottom of the break list with everybody's name when I came back from a break, I would go plug in at any of those sectors, I would ask who's up next for a break, and then if that person wanted to go on a break, I would go to that position, get a relief briefing from that person, and that person would then go on break.

After their break, they would come back and they would go to the next name on the top of the list, relieve that person to go on a break, and we'd do that for breaks during the day, as well as for lunch periods. We work standard eight-hour shifts, which includes a 30-minute lunch.

We're spoiled. I think you'd be shocked as far as plug-in time on position is concerned, too, but I won't get into that. What's plug-in time on position? Every time a controller plugs into a position, either electronically or by paper, they have to write their initials and the exact minute that they signed on. When they get relieved, they have to sign the exact minute they get signed off.

Of course, management uses that to determine productivity. Some facilities average, dare I say five hours in a shift of actual plug-in time on position. Others, obviously the more busier facilities that are lesser staffed have higher numbers of plug-in time.

Q: How many hours is a controller allowed to work in a 24-hour period?

MR. MOGILKA: Sixteen, in a 24-hour period. It's a very odd shift, and I'm not sure why they do it, but let's assume that I have two days off, Saturday and Sunday are my days off. We work five days. I come back on Monday to work, I usually start at 3:00 in the afternoon or even 4:00 in the afternoon, work till midnight. The second day back on Tuesday, I would come in around 2:00 and work till 10:00 that evening. On Wednesday, I would come back about 8:00 in the morning and work till four. On Thursday, I would come in about 7:00 in the morning and work till three, and then if I was assigned the midnight shift, I'd come in at 11:00 Thursday night and work till 7:00 Friday morning, and then I'd be done 7:00 Friday morning and wouldn't have to report back again till Monday at 4:00 in the afternoon.

Q: You get a four-day weekend.

MR. MOGILKA: The controllers like it because of the four-day weekend. Of course, you're out of it until 3:00 Friday afternoon anyway. But that's their choice.

Q: Does the 16 hours entail plug-in time, or is all the time you're at the facility?

MR. MOGILKA: It doesn't entail plug-in time. What they count is actual assigned duty time in the facility.

Q: On this on-the-job training, you mentioned how critical it was to have good OJT trainers; do you do any trainee train-the-trainer work with your people?

MR. MOGILKA: Unfortunately, we don't have a very extensive program to train. We have maybe about a two- or three-day train-the-trainer program. We talk about different learning styles and talk about personality conflicts. But I think it's more informal than it is formal.

Each crew of controllers has a supervisor, and that supervisor knows the personality of every controller, and usually it's a supervisor that makes that selection as to who's going to be the instructor, taking into consideration the personality of the instructor, as well as the personality of the student.

They also work as a team. The supervisor, the OJT instructor as a student, they get together and say, "Our goal is to get you through this training program, our goal is to get you certified. We're here to help you. If there are times that you're not able to work OJT because the traffic level is too low, then we're going to give you some time in the back room to study the rules and procedures, to draw your map, to draw your air space." Really, they have to work together. I think that's why I passed and made it through, because of that effort.

Q: Does the OJT trainer, does that individual you might choose have the right to refuse to take a trainee?

MR. MOGILKA: Yes.

Q: How do you get around the age selection; you said 30 years or younger. How have you avoided discrimination charges?

MR. MOGILKA: The fire guys are creating a unique paradox, because there is a mandatory retirement age of 56 for air traffic controllers. So in one sense, we have to have someone that we're forcing off the boards at 56, but yet we have someone in the classroom that was 62 going to go back and work airplanes. The ones that were rehired are under a waiver, so that's how they can do that.

The under-30 rule, we have evidence, we have a medical research institute at the Academy that has documented evidence of a significant loss of learning capacity after that particular age. [Laughter] It's a young person's game, it just is, and also because of the early retirement factor. If I work 20 years, I can retire when I'm 50; if I work 25 years active traffic, I can retire at any age. So if you hire someone at 45, if they reach 50, they can theoretically retire. Really, they would be just getting to learn the occupation.

I don't think it's not that someone who's older couldn't learn it, it just takes so long to get there. It is a very stressful job, probably more so because of the shift work as well, as you all know from being dispatchers.

Thank you. [Applause]

## **Panel Discussion: Challenges as we Enter the 21<sup>st</sup> Century**

Thomas Keane, Railroad Safety Specialist, FRA

William Clifford, President, ATDD

Sheldon Boggs, Director, Operating Rules, Amtrak

Rodney McCorkle, Manager of Operating Rules-U.S., CP Railway

Moderator: Judith Gertler, Manager, Human Factors, Foster-Miller, Inc.

MR. RASLEAR: Well, this is almost it. We've had some very good talks, and the dialogue has been quite informative. We are going to close the workshop with another panel, moderated by Judy Gertler from Foster-Miller. The focus of the workshop is on the train dispatcher training challenges that we all face as we head to the 21st century.

We have intentionally a panel that represents several different dispatching interests, including both passenger and freight railroads, labor, and government. Judy will introduce the panelists once they are all set up.

MS. GERTLER: If anybody feels the need to stand up and stretch, I know with so many former dispatchers in the room, people are used to sitting in one place for eight hours.

The purpose of this final panel discussion is to reflect on what we have heard today and to look to the future. Hopefully, at the end of the hour, we will have identified the challenges we will all face in training the next generation of train dispatchers, and I think to some degree the discussion we've already had this afternoon has talked about those challenges.

In my opening remarks this morning, I raised several issues concerned future train dispatching and how we train candidates for the job in the future. Let me just repeat those now.

How will advanced train control systems change the job of the dispatcher, and how will training programs instruct future train dispatchers on the use of new technology?

Will the decreasing cost of computer technology allow more widespread use of computer-based training for dispatchers?

Will changes in training programs be needed to accommodate the increasing number of trainees without railroad experience. I think this last one we've addressed quite significantly.

One other issue or direction that Tom Raslear gave this morning is he said that FRA would like to find out from this group what research issues would be appropriate for

the office of R&D to pursue in the future. So I that's something else I hope we'll hear something about in this last hour.

In this session, we will hear from four individuals concerned with training dispatchers, but representing different perspectives. I have asked the panelists to discuss the challenges that they anticipate in the coming years with particular emphasis on their perspective.

Let me introduce the four panel members now. First, we'll hear from Bill Clifford, who is to my left. He's the president of ATDD, the dispatchers' union. Bill's career spans nearly 50 years, including 25 years as a dispatcher. He began his career with Railway Express, and I'm actually old enough to remember Railway Express. Then he went to the New Haven. Through a series of mergers, he subsequently worked for Penn Central, Conrail, and Amtrak, and although he had several different employers, he was one of the fortunate ones in the sense that he didn't have to move and throughout his career he was based at South Station in Boston.

Next, we'll hear from Tom Keane, who we've already met today. He's a railroad safety specialist for FRA.

To Tom's left is Sheldon Boggs, from Amtrak. Sheldon has 22 years of experience in Amtrak's transportation and customer service departments. He was initially hired as a block operator on Amtrak Northeast's Corridor in 1976, and was promoted to rules instructor in 1980. Since then, he has held various positions of increasing responsibility in the Amtrak system, and now he is the director of rules for the Northeast Corridor.

Our last speaker is Rod McCorkle, who is manager of operating rules for CP Railway's US operations. Rod is responsible for insuring compliance with federal, state,

and local regulations, including insuring that the workforce properly interprets and applies all rules and regulations.

Rod is a member of the Operating Rules Information Exchange Forum for AAR. He also serves on three operating rules associations and several RSAC subcommittees.

Each of our panel members will speak, and then I will invite all of you to give us your questions and opinions. So, Bill, would you like to start?

WILLIAM CLIFFORD: I think to give the viewpoint of the dispatchers' union on this, we can cover a few things that were already discussed today. One was the Devoe Report, which came out in 1974, prepared for the Federal Rail Administration by the Volpe Center. It was an excellent report and it had certain recommendations for dispatchers. Among them was training, and among them also was fatigue, stress, and workload.

In the report, it said that the FRA didn't have the expertise at that time to really develop training, or really develop a study on stress, but they would hire consultants to do it.

In 1988, there was another report prepared for the FRA. That report was at least 50 percent copied right out of the Devoe Report. It made the exact same statements about training and stress and nothing had been done from '74, and nothing was done after 1988.

In approximately 1992, just before the change in administration at the FRA, they issued a followup report. They again copied a great deal of it out of the Devoe Report and again made the same recommendations.

Now, when the new administrator came in, we had a meeting with her and we told her that there'd been three reports, basically all saying we need consultants to do this, and never a followup by any. All of this had been mandated by legislation from Congress,

and basically we felt that if they were just going to keep putting out the same recommendations and never doing a followup, they were wasting the taxpayers' money and the Congressmen's efforts.

Shortly after that, there was a training idea. At first it was the BN and Amtrak, and then Tom Raslear told me that two contracts had been let out to Foster-Miller. I liked the concept of those two contracts, because one was on training and the other one was on fatigue, stress, and workload, which hasn't really been a topic today.

Since I believe the better trained a dispatcher is, the less stress on him, therefore the less fatigue, therefore the easier he handles his workload, and the less fatigue. So I like the concept on that, and basically we were asked, "Do you want to follow the system we've been doing with the BN and Amtrak, or do you want to go to the Foster-Miller concept," and my conclusion was we should go to the Foster-Miller concept.

Now, today it was mentioned of the Rail Safety Advisory Committee, and it was said the training was not under the Rail Safety Advisory Committee, and it was said it was tabled. Actually, I believe a better word would be never taken up, because whereas I believed the Foster-Miller concept was good -- and this has to credit the FRA, too, who conceived it, in letting out those contracts -- that nevertheless to put it into the Rail Safety Advisory Committee, and there are people here who are on that, it is a process that requires consensus, and the people who sit on it, who have a vote, are suppliers, the railroads, and the unions.

It's very difficult and time-consuming to reach a consensus. Some have been reached, such as the new rules on protecting workers on track. Last Friday, the final rule on communications, and so forth. But it's a time-consuming process.

The other concern I had, which has been said here several times today, I think the Railtex gentleman expressed it very well, is the difference in railroads, and we felt that



there was not such a thing as a training rule that could fit all types of railroads for dispatchers.

Now, that does not mean that we do not want rulemaking in training; we do want rulemaking in training. And it does not mean that we don't feel this should eventually lead to certification; we do feel it should lead to it.

Now the question may be, why do we think they're standardized or we need rulemaking in training? And quite frankly it's because some railroads will never have a real training program for dispatchers unless they are required to.

The second factor is that even if the railroad sets up a good training program, and some presentations were made today from railroads that have a good training program, the program quite often falls flat on its face as soon as it gets out of the training classrooms, because once it gets into the dispatcher's office, the people in that dispatching office, the management, unfortunately have other things on which they're measured; one being their budget.

If they can short the training that is supposed to take place in that office on-the-job training, there is unfortunately too many dispatching offices around the country where it's not just reduced a little, it's virtually wiped out in the rush to get a person on a desk at a lower cost.

So we felt that unless there is some standardization in rules requiring certain things from railroads, that those problems would never be corrected.

Now, that doesn't mean that each rule is going to be the same, and we know this will be a complicated process for the FRA, to draw up one, but we think there has to be a minimum of training rules, and they will differ from one railroad to the other, and the FRA would look at that training program and say, is this adequate for this road, and then they would see that that road actually carried it out.

Now, beyond that, we believe that simulators are essential on at least the class one railroads. Bob McDermott from the Long Island talked about the simulators and said they create situations. They have a person sit down and run the railroad just as he would at the busy period, and they also create the unexpected for them, and we believe that if you just train a person on a simulator without creating those unexpected occurrences, that you're not really going into what the dispatcher will be faced with in many times.

We also believe in training for the instructors. Unfortunately, some instructors seem to be picked because they were a trainman who was injured and has a lawsuit against the company and so they give him a job as a trainer. We feel that there has to be training for the instructors. There has to be a periodic evaluation, because I think there are quite a few railroads that I've talked to right here today who tell me that their washout rate is at least 50 percent. There has to be a periodic evaluation before the company wastes money on the entire program and then decides the person can't make it.

I think when Mr. McDermott spoke about the setting up unusual situations, that was a good point because you can train the person in the training school and he can understand the concepts perfectly, but he cannot take the pressure, and that has to be determined, and it can only be determined in situations like Mr. McDermott said.

Finally, to paraphrase the gentleman from the Alaska Railroad, training programs and instructors sometimes are quite disagreeable, but we do need them. [Laughter]

THOMAS KEANE: FRA's involvement in the 1993 train dispatchers' assessment was to find out what circumstances were not being addressed by the railroads that we gave them an opportunity to correct by themselves for the past five years.

We went in and we looked at various systems. We selected, I believe it was 22 railroads that were involved in the 1993 assessment. I was charged with that responsibility. I brought 15 FRA instructors with train dispatcher background, ranging

from eight to 20 years, 25 years, and we went on these railroads. I took two people on there that have extensive chief train dispatcher background and made them team leaders. Reported back to me. It was one of the first audits that was done by FRA—(end of tape)

MR. KEANE: --a lot faster than any other report was written. Then we concluded that there were two areas, like I mentioned earlier today, that training was one of the problems and operational testing.

So I discussed with my superiors how I wanted to handle the training aspect of the audit and I decided to put together a partnership with a freight railroad, a passenger railroad, someone dealing with passenger service, and also had a national exposure dealing with various book of rules, which was Amtrak. Amtrak was very receptive to our idea.

Then I went and asked the ATDD to join us in this endeavor, and I requested that two active dispatchers be involved in the situation. They accomplished that by bringing one from the freight and one from the passenger area.

We got together for about three or four months, argued, swore at each other, and we came up with the standard elements that we showed you today.

I was tasked to present them to the RSAC committee on March 24th, and I was unable to attend that meeting and I requested two people who were on the committee to present it in my absence. It was my understanding that there was a side conversation that the training elements were not needed and they weren't going to bring them up at the RSAC meeting, and that's the reason why I said they were tabled. To my knowledge, we can still bring them up, but we don't know where we were going to go with them.

Now, we have to discuss that some other time, to find out where we're going to stand with that particular endeavor. That's about it; I just wanted to clear that up.

SHELDON BOGGS: Good afternoon, ladies and gentlemen. It's a pleasure to be here today, to be able to represent Amtrak at this forum, Amtrak's Northeast Corridor.

On the Northeast Corridor, Amtrak has 25 train dispatching sections that dispatch approximately 550 miles of railroad between Washington, DC, and Boston, Massachusetts, not including about 55 miles of track between New Rochelle, New York, and New Haven, Connecticut that's dispatched by Metro North.

We also dispatch the railroad between Philadelphia, Pennsylvania, and Harrisburg, Pennsylvania, and between New Haven, Connecticut and Springfield, Massachusetts.

As we move into the 21st century, I see two major challenges facing the Northeast Corridor in regard to train dispatching training. The first one has already been discussed at length today, so I'll try to keep it brief, but it's the challenge of selecting and training new train dispatchers who have little or no experience as a block operator.

The second challenge is the challenge of training new and old train dispatchers on the new technologies associated with the Northeast Corridor's new high speed rail project.

To speak on the first challenge, in late 1987, Amtrak began closing down its block and interlocking stations on the Northeast Corridor and remotely controlling those interlocking from our train dispatching offices in Philadelphia, New York, and Boston.

In 1987, the Northeast Corridor had sixty block and interlocking stations from which to recruit experienced block operators for the position of train dispatcher. Today, the NEC has only 16 block stations remaining.

In 1976, when I hired as a block operator, you had to have at least five years of experience as a block operator before you were given an opportunity to post as a train dispatcher. Now we're promoting block operators with less than one year's experience.

On one of our divisions, our New England division, which has only two block stations remaining, they've had to hire 23 train dispatcher trainees with no prior block operator experience in the last two-and-a-half years. None of the other divisions have had to do that yet.

Twelve of the trainees had some railroad experience ranging from train conductor to clerk; needless to say, the conductor's back conducting again.

The other 11 trainees had no prior railroad experience. Their work experience has ranged from hotel doorperson to psychological counselor. Our best recruit, thus far, has been a local deli manager in Boston who was discovered by one of our personnel employees, who noted her for her exceptional customer services skills and her demeanor, attitude. So she's been our number one recruit so far.

And I think the doorperson is actually doing better than the psychological counselor [laughter], so you really can't tell by their past experience. I think the counselor's thinking about things too much. [Laughter]

Due to their lack of experience in controlling train movements, all 23 trainees have taken a lot longer to complete the OJT phase of their training than people with a lot of experience on the blocks. Where a block operator with several years' experience might take four, five weeks to qualify on his or her first dispatching section, trainees with no railroad experience have taken an average of 16 weeks to qualify, and that does not include time spent in rules classes or CETC console training. CETC is the name of our train dispatching computer system. Trainees with railroad experience in another craft have done only slightly better than those hired off the street, averaging 15 days to qualify on their first section.

While these new dispatchers have, for the most part, maintained an average safety record, it will be several years before they exhibit the same proficiency as their

counterparts who had several years of experience as block operators prior to training as a dispatcher.

One of my goals after this meeting is to push for selection tests. We currently don't have any type of selection testing, aptitude testing, and I think we desperately need that to improve the quality of train dispatchers, that we'll ultimately be having to hire more and more off the streets.

Regarding the second challenge that Amtrak's facing, training new and old train dispatchers on new technologies and equipment associated with our new high speed rail project. On October 1st of 1999, Amtrak will begin operating new high speed train sets at speeds up to 150 miles an hour on the Northeast Corridor.

Many new technologies will be needed to support this operation, all of which our train dispatchers will have to be familiar with and trained on.

The new train sets will be equipped with a new tilting system which will enable them to operate faster around curves than conventional equipment. They will be equipped with many new on-board surveillance and diagnostic systems which will be used to detect on-board mechanical failures and exceptions.

They and other trains will be equipped with a new form of train control system called ACSES. That stands for Advanced Civil Speed Enforcement System. ACSES will supplement our existing cab signal and speed control systems that we have on the Northeast Corridor by enforcing all permanent and temporary speed restrictions and enforcing a positive stop at stop signals. Our current train control systems will only ensure that the engineer acknowledges the more restrictive change and in the case of a stop signal, he has to get down to 20 miles an hour because he would receive a restricting cab signal prior to reaching it. But he could still go by it at 20.

So the new system, in addition to enforcing all the temporary and permanent speed restrictions, make sure that the train stops. If the engineer doesn't take action, it will stop it for him.

ACSES will function through a network of wayside transponders, data radios, and sophisticated on-board hardware and software, all of which our train dispatchers will have to be familiar with.

In the case of temporary speed restrictions, our dispatchers will be required to input the restrictions into new computer systems and electronically transmit the restrictions to the ACSES computers on board the train for enforcement.

A recent order that just came out from the FRA on our ACSES system is giving us a one-year grace period in which to enforce temporary speed restrictions through use of wayside transponders for one year; that is from October 1, 1999, to October of the year 2000.

FRA's giving us a one-year grace period to finish the design and implementation of this new system where the train dispatchers will input the temporary restrictions directly into a computer and transmit them to trains. So that's our ultimate goal, and we have until October of the year 2000 to do that.

And last, but not least, all main track between New Haven and Boston will be equipped with an overhead catenary system, which will deliver 12,000 volts of electricity needed to provide propulsion power to our new high speed train sets, as well as our other electric trains that will now or then be able to operate through from Washington to Boston without the current engine change at New Haven from electric to diesel, or diesel to electric, because the tracks between New Haven and Boston are not currently electrified and energized.

Our train dispatchers will have to be trained on all of these new technologies, new and unfamiliar technologies, so that they can effectively do their jobs as facilitators of safe and efficient train operations.

RODNEY McCORKLE: One thing about going last, all I have to say, if you've been listening all day, is ditto. [Laughter] We have a lot of challenges as we approach the 21st century. We've been faced most recently with the year 2000 problem, with all the computer systems, that we're all starting to gear up for.

One thing that we have is technology is changing faster than most railroads or employees can keep up with. Part of that's due to mergers. We heard some of that this morning. Spinoff of other railroads creating more shortlines. This in turn creates many problems within the industry, such as technology, rules, operating procedures, differences, to mention a few, due to systems that are not compatible with each other and have to be modified in order to work.

In either case, it creates down time as adjustments, dispatcher's training, ... need to be accomplished while on the job or specially assigned training classes in order to accommodate this.

Training will become one of the biggest issues that I can see as we face the 21st century. It's a big issue now and it's going to continue to be.

From my opinion -- and it's only my opinion -- the new employees that railroads are hiring in today's environment lack the experience that's needed to fill these positions, especially that of a train dispatcher.

The railroad in most cases ... operators draw upon which work with a train dispatcher on a day in and day out basis. These individuals have the general knowledge of what was required upon the dispatcher through the process.



The days of the operators are pretty much gone. We do still have some block operators in Northeast Corridor, but as far as the Western railroads, they are gone.

So where do we get candidate selection? Right now, we're going from the inside as much as possible, but as we've heard this morning, we hire conductors, they go back conductors; we hire engineers, they go back as engineers. We're going to maintenance of way, but even the maintenance of way cannot take the stress sometimes that's put out there.

Since the experience of the candidate is lacking, we must turn the resources and experiences that we have to future training programs that will give them the experience before they actually start on-the-job training. Training departments will need to be creative in developing and implementing programs to enhance the overall new employee to a degree that exceeds today's standards.

The classroom style training, as I see, where several employees are trained at one time, will only work for the initial start of the process to become a train dispatcher. This will probably encompass the safety rules, the general operating rules, and overview of the terminology used.

After this time, they will need individual instruction in regard to several elements in train dispatching, in order to properly elevate the individual to see if they can comprehend or handle the position we're trying to get them to.

On-the-job training will be increased as we're already starting to see. We heard today some are 14, some are 17, some are six to seven months. The dispatchers themselves that are doing the training are lacking in experience, let alone able to provide the necessary on-the-job training.

We have a very young office on the CP Rail system, and we expect trainers who have two years experience to do training for their own. So we've got to get them up to the speed where they actually are dispatchers before they start their on-the-job.

This will, in turn, lay the burden on the training instructor, to make sure the individual is ready to start training before even sitting at the desk through simulation and evaluation exercises.

The train dispatcher's experience of today and tomorrow is not that of the past. We see this through the type of technology that railroads continue to implement or change to reduce the risk of human error incidents.

We all think technology is going to wait for the railroads to catch up; we've got to think again, we've got to take the step forward. The railroads and employees need to be on the cutting edge of technology, ever thinking to the future, and not wishing that we also had a system like one of the other people.

The challenges for the 21st century are many and way too numerous to try and even capture all of them. I, for one, don't even want to think about it, but one cannot stop time.

We must approach these challenges with a willingness to make sure that safety is in the forefront of any training in order to make sure the railroads will survive in the most efficient manner possible, and that technology is in line with that concept.

In closing, as we're approaching that age of retirement, the biggest challenge we all face in the 21st century is the realization of what we can do to change the culture in our training of our train dispatchers. Thank you. [Applause]

MS. GERTLER: Do we have some questions? I have one question for the panelists and this group; you can tell me now or call me afterwards: I'd like to know if

you found this a useful forum, and is it something we should suggest to the FRA that they do again at some point, in a year, in two years? Anybody want to say anything?

MS. DOLL: I found it extremely informative for me, but I'm hoping that my counterparts back here were listening. I am a training instructor and anyone who's been a training instructor for train dispatchers is going to speak up and say that we've been pounding and pounding and pounding about how important the training is for train dispatchers. It's management that's got to listen to us and know the length of the program that's needed and what the quality of the program has to be, and that it not be shortened. If they're listening, then this worked.

MR. CLIFFORD: I heard Rod say that the Soo uses two years minimum for an instructor, and I want to say that I think that's a very good idea, but one of the reasons we mentioned before about standardization is that we have some railroads today, all new dispatchers have a probationary period. It varies in amount of days on different railroads. During that probationary period, they have sat down to work, they have worked desks, but the carriers can wash them out at any time within the probationary period without any trial or any investigation.

And yet, we have some railroads today that have people who come out of the training program and are working, but they're still in their probationary period and these railroads are short of dispatchers, and they have those people training the next people who came out of the training before they've even gone through their own probationary period.

It's reasons like that that we feel that there must be standardized training, and when I said I realize it's a very difficult task, we have such a tremendous difference. Some railroads probably have one engine, it goes down one branch line three days a week, and another one two. Certainly they don't need dispatchers on that line, they're the only thing out on the line.

Others have totally dark territory, so the training program needed for them and the requirements that the FRA would like to impose would be totally different from another type of railroad. We just feel there each railroad should have to file a training program with the FRA, stating the type of their territory, the type of traffic there was, and so forth, and the FRA would then pass on these as, yes, this is a good training program for your type of operation. But they then could follow up to see that it's enforced.

Right now, that doesn't exist and too many of the decisions are made not on the basis of safety but on what'll be the cheapest way to do it.

MR. MOLLER: With all due respect, I'd like to take mild exception to that. I think we've heard that having qualified dispatchers is a critical need and that companies recognize that and are devoting significant resources to it.

I'd like to also point out that training people off the street isn't something brand new. I was a product of that in '79 when SP hired me during the last big meltdown in Texas. They were desperately short of dispatchers and they hired a group of us right off the street. We had certain prequalifications before we would be considered. There were 12 of us in the class. I think three washed out during the training process, I think eight established seniority dates.

In fact, I was talking to Pat here and some of my old cronies are still out there working today. So I think it's successful, I think we've solved it.

I think some of the things that Bill has suggested in terms of the training programs begin somewhat standardized, recognizing that one size doesn't fit all, there's merit in that. I think that we'll hear concern from FRA -- it's inappropriate to speak for them -- but I know they have a lot of demands on their time, and I know that management has suggested such things several times in different venues and there's concern because

obviously it takes staff resources to approve programs, and to then of course enforce them.

I think that's a legitimate concern, we can't just say, that'll solve everything, because there has to be the wherewithal to do that.

Also, finally, a little comment on the Rail Safety Advisory Committee. I was present the day of the discussion we've heard about. I think the reason that it wasn't discussed, and I wasn't privy to the hall conversation directly, so perhaps I'm not completely accurate, but I think, if I understand right, on the day of that conversation, there was a thought that the Rail Safety Advisory Committee, by definition, is to advise FRA on regulatory matters, negotiated rulemaking is often used to characterize.

There was some sentiment expressed at that time that perhaps it was premature to get into a discussion of regulations, that here were some training principles that were being identified, that were worthwhile and perhaps that's as far as it should go at that point.

So that's my take on it, that might not be 100 percent accurate, but I don't know if there was anything sinister or diabolical about not addressing them in that forum. I think it was a matter of, "Well, the reason we form these committees is to create regulations and is that really what we want to do with this one?"

MR. McCORKLE: Bill, I don't remember saying that our instructors had to have two years' experience. We are using them that have two years' experience, though we never disagreed before in the past [laughter], I just wanted to make that point clear. What I'm trying to stress is that our training programs have to go beyond that.

MR. MCDERMOTT: Judy, I just wanted to say, and I said earlier in my presentation that, yeah, this is a good idea, getting together, and I can't remember in my 24 years getting together with other dispatchers and talking things out like this, and I

think it brings a lot to the surface, and it's somewhat comfortable, somewhat, in knowing that we all share the same problems. And, yeah, I would like to see it repeated.

I just wanted to bring up something that Bill said. Bill, you're not alone when you talk about the teaching inexperience. We went through a problem, and granted we still have tower controllers out there, we have 14 towers, where we had such a turnover of people that were hired during the '50s, '60s, and '70s, who all of a sudden one day opted to retire, they were retiring in waves, and we ended up hiring in '93, '94, '95, those years, literally tons of operators.

The trouble was we came to the OJT part of training and operator, and to some extent dispatchers today, because we have a young office. We ended up with a new person sitting down with a new person. And it was scary. I'm not going to stand here and say I have the answer, but that's one of the things collectively, again, we have to address, new people training the new people and overall training, which we're talking about today.

So it's a problem that we all, at least Long Island suffers from, and I certainly agree with you and sympathize with those thoughts.

MR. KEANE: To elaborate a little more on the training of the trainer, or a dispatcher trainee training another dispatcher, on a couple of railroads, we found what was happening was because of the outflux of people leaving the railroad industry for whatever reasons -- mergers, people didn't want to move -- that the railroad had to do an immediate hire, and they were doing a hire of people and they were putting them through an accelerated program because these people had some kind of railroad ability or knowledge, and what was happening was that the product was getting not trained properly when they sat down in the seat, because they were running into situations they never encountered before in the training process.

So that is a problem, a big problem, and it needs to be addressed.

Q: On our railroad, we call that kids teaching kids, and it has the same impact to society of kids giving birth to kids and kids killing kids.

Judy, you asked the question earlier about has this been a profitable exercise and should it be done again. I think the answer to both is yes. I would recommend it be done again in probably about a year. I would have to assume, based on the information that's been given out today, a lot of the railroads represented are going to begin reevaluation of training programs, and I would think perhaps some are going to begin an evaluation of a new training program, and perhaps a year from now would be a good time for everybody to get back together and see what has been accomplished.

Personally, I don't believe that the government has a place in setting regulations for training programs if the training programs can be implemented successfully, and I believe railroad industries have come a long way in taking the front in establishing those kind of programs without forced hand.

MR. KEANE: That brings up the subject I brought up earlier this morning, that I'd like everyone in this room, or every railroad in the country, to take a look at those training elements that we presented this morning and see if your training program includes any of that information because it is vital. It's good information, it was put together by a well-educated group, and a well-sponsored group. There was representation all around the table, and I think it's a great tool. I wish that people would use it, I really do.

Q: I own CSX property and I talk about that because that's the carrier which I work for. They have initiated a new program in dealing with culture, and I'm quite sure that some of the major railroads are very familiar with the culture change which we have been dealing with. They've dealt with discipline, the way in which it is being assessed.

It was all due to the fact that it was one of the things that FRA looked at which talked about labor and management all having what they call the three-legged stool, where everyone is going to have to sit there and have their part.

It used to be onetime, I think years ago, FRA sat over here, the carrier sat over here, and management sat back there, and no one, absolutely no one wanted to talk to each other, because if one did, the other one didn't, and that was the way they ran. They kept things in round robin, more or less, as far as their interaction between each other.

In essence, as far as we talk about training for the train dispatchers of the 21st century, if FRA decides that they don't want to make it mandatory, we go back to that same old bag, we'll say that business goes on as usual. We're back to where we were 180 years ago: Your railroad does what you want to do, your organization does what you want to do, FRA, well, you sit over there and if you see something that's so bad, then you'll come in and tell us. Perhaps.

But if FRA does not take an active part in making this program part of regulation, we've lost everything that we're here today for. Thank you.

MR. KEANE: I'd like to answer that with this comment: We started the brickwork. The brickwork is there, we've brought all the people together. We put out the material for everyone to look at. What we're looking for now is how to handle that material. We've got to get together and we've got to talk and we've got to get this information to, to work with us, to work for the employees that are performing the job, for the railroads that are looking for the performance out of the employees and, again, the bottom dollar, we have to watch the money. The railroads are looking to make profits. We have to establish some kind of rapport between the three groups.

That's what this is all about, this is the beginning, this is the brickwork. We need to establish some kind of rapport. We've got to continue this. I've heard several people



in this room say, "This is a good thing, this is a good idea." Then in my opinion, we should do it within six months, eight months from now, come back with ideas. That's why I gave you my email address. I'd like to really hear from you; I'm not just giving it for "here"'s sake. I want ideas, and I can pass them on to the people that I'm dealing with. I'm dealing with Jolene Molitoris, the administrator of the Federal Railroad Administration.

Although the Democrats will probably be out of office in two years, I don't see her leaving. [Laughter] I think she's an excellent product coming out of the FRA. I'm really ecstatic working for her. She's a dynamite person, really. She's for rail industry, she's for everybody, not just herself but everybody. She wants to see everything done-- actually, she wants to see it done tomorrow, but sometimes that cannot be done. We have to sit down and we have to negotiate, we have to solve and resolve some of the problems we have facing us.

I'm hearing a lot of stuff today that I see in the future. I'm looking at right now, in the future, 20 years from now, maybe 15, I don't know, it depends on how fast the technology catches up, this ACSES, that's the beginning of it. We're going to see, in my opinion, two people on the railroad on the transacting side -- a dispatcher and an engineer. We're going to have a computer on a train, you're going to have a computer in the building, and both of those people are going to be sitting there working with those computers. That's my vision of where the dispatcher is going in the future.

MR. CLIFFORD: Just in agreeing with Tom, I'd like to say one thing. Bill Clinton has amply demonstrated that he's not a good judge of women and has poor taste, but in selecting people to fill jobs, when he selected Jolene Molitoris to be the administrator of the FRA, it was one of the best choices he's every made.

MS. GERTLER: If we don't have any more questions, I'd like to thank everyone for coming today. I think we all will agree that this has been a very informative meeting.

Tom set out the goal at the beginning of the day that he hoped everyone would go home with at least one thing they had learned, and I think most of us can say we're going to go home with a whole list of things that we learned.

I think what made this such a productive meeting for all of us is that we had people here representing different perspectives. We had people who were working dispatchers, people who were former dispatchers. We had the labor representatives, we had the government here, we had all sizes and shapes of railroads represented.

I hope if we can do this again that we'll draw on the same diverse group of people and again make it a valuable experience.

I'd like to thank Tom and FRA for sponsoring this and making it possible for all of us to have this forum here to share ideas and thoughts. Tom, do you want to say something?

MR. RASLEAR: I would like to thank everybody for participating, and I would like to emphasize to you that if we're going to help any further, we need to have your comments about what it is that you think we need to do in terms of our research program. I've heard stuff about selection, but I'm also wondering have we done enough? When you see the report when it comes out, and you'll get it, have we done enough in producing what is in that report? Do we need to give you more information to use in putting together training programs, et cetera.

I'm in a poor position where I stand to be able to do that without your input. It's essential that you fill that link in and let us know. You have my address in the materials that were handed out today. My email is just like Tom Keane's, except it's <thomas.raslear@fra.dot.gov> You have my phone number; call, write, get in touch with the Foster-Miller people if you feel threatened by me. [Laughter] Do whatever you can to let us know.

Once again, thanks for coming. I think this was a great session. A hand to all of you. [Applause]

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