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A Study to Determine Appropriate Training Models for Maintenance Technicians - Cox Communications Hampton Roads

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A STUDY TO DETERMINE APPROPRIATE TRAINING MODELS FOR

MAINTENANCE TECHNICANS

COX COMMUNICATIONS HAMPTON ROADS

A RESEARCH PAPER PRESENTED TO THE GRADUATE FACULTY OF THE

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IN PARTIAL FULFILLMENT OF THE REQUIREMENT

FOR THE

DEGREE OF MASTER OF SCIENCE

IN BUSINESS AND INSUSTRY TRAINING

BY

JOEL P. HORNER

JULY 1998

APPROVAL PAGE

Joel P. Horner prepared this research paper under the direction of Dr.

John M. Ritz in OTED 636, Problems in Education. It was submitted to the

Graduate Program Director as partial fulfillment of the requirements for the

Degree of Master of Science in Business and Industry Training.

Approval By: _____   _____
                        Dr. John M. Ritz   8-4-98
                        Graduate Program Director   Date

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CHAPTER I

INTRODUCTION

Cox Communications is a growing organization that has expanded its service area during the past two years and is offering new services other than just cable television. These new services include high-speed data retrieval in the form of a cable modem and telephony service. Furthermore, with this expansion comes an increase in personnel, work shifts, and training requirements.

As the company grows, so does the way maintenance technicians should be trained. Traditional classroom lectures and job training may not be the most effective methods to train maintenance technicians. There are other ways to train new technicians which would provide ongoing refresher training and introduce new technology. This study will explore how the training currently exists and will make recommendations as to how training can best be accomplished, attaining the goals of learning required to maintain experience and knowledge levels.

STATEMENT OF PROBLEM

The problem of this study was to determine the appropriate models and formats for training maintenance technicians of Cox Communications Hampton Roads.

RESEARCH GOALS

The following goals were used to direct this study:

1. Determine an appropriate training model for Maintenance Technicians, per training occasion.

2. Determine an appropriate training format for Maintenance Technicians, per training occasion and model.

3. Determine the appropriate administrative and management aspects of the training models and formats for Maintenance Technicians.

BACKGROUND AND SIGNIFICANCE

With the increased need for maintenance technicians, both Technician II and III, the selection of training should be relevant for the learning opportunity. This is where the best method of training fits the training need. The training track that is currently in place at Cox Communications may not be relevant for the anticipated increase in technicians in the future. By instituting procedures that will incorporate various training models and formats, Cox can have better-trained Maintenance Technicians, which will increase productivity, effectiveness, and customer satisfaction.

Technical Service Representatives (TSR), who have completed the Tech II Class, currently are the only pool of personnel that are qualified for a Maintenance Technician II position. This class is a four-week session that introduces them to the tasks of plant maintenance. The class involves two weeks of instruction and two weeks of shadowing or riding with an experienced Maintenance Technician II. For a few newly hired Maintenance Technician II, the completion of this class may have been as long as two years before a position

becomes available. To date the only additional training would be the placement with an experienced Maintenance Technician II for one on one training. They would ride with that technician until the Supervisor deemed them qualified as a Maintenance Technician II based on the trainer's recommendation.

Adult learning concepts should be considered in designing and integrating various modals required for different areas of study. Malcolm Knowles tabulates how training should work. "When planning an educational activity, the pedagog thinks in terms of drafting a content plan, and he has to answer only four questions to come up with a plan: (1) What content needs to be covered... (2) How can this content be organized into manageable units... (3) How can these content units be transmitted in a logical sequence... (4) What would be the most effective methods for transmitting this content?" (Knowles, 1996, p. 253) Additionally, Boverie, Mulcahy and Zondlo suggest that in training "...learning is a lifelong proposition. Not only will there be a demand for training to keep up with technological advancements, but there also will be demand to retrain ... (those) who will be displaced because of such advancements." (1995, p. 3)

LIMITATIONS

Although this study may seem broad in scope, it utilized the following limitations. It was:

1. Limited to the Maintenance Technicians in the Cox Communications Hampton Roads area.

2. Limited to thirty-one Maintenance Technician II's and nine Maintenance Technician III's located on both the Southside and the Peninsula.

3. Limited to four training models that include Lecture, Self-Paced Booklet, Computer-Based Training, and One on One On-The-Job Training.

4. Limited to three training formats that include On-The-Job, Refresher, and Job Instruction Training.

ASSUMPTIONS

When conducting research, certain circumstances must be assumed. This study used the following assumptions:

1. The Maintenance Technician II is responsible for the care and maintenance of the plant.

2. The Maintenance Technician III is responsible for the care and setup of sweep and reverse sweep maintenance of the plant.

3. Various training methods may or may not be appropriate for either Maintenance Technician II or Maintenance Technician III.

PROCEDURES

This research was designed to determine the best possible training models for the various formats of training associated with Maintenance Technicians in the Cox Communication Hampton Roads area. To obtain that information, a survey was designed and distributed to all Maintenance Technicians.

The survey consisted of a series of questions that required the recipient to answer and rank their answers for consideration of training models and formats in the organization. The results of the survey were then tabulated and analyzed to determine appropriate training models for the different formats of training for Maintenance Technicians in the Cox Communication Hampton Roads area.

DEFINITION OF TERMS

The following is a list of terms that are defined to provide a clearer understanding of the research project.

Appropriate — Applicable training that fits the various training levels.

Computer-Based Training — Computer-Based Training presented either on a CD-ROM disk or via the Intranet.

Intranet — An Internet network within Cox Communications including the Hampton Roads area.

Maintenance Technician II — Maintenance Technician responsible for conducting general maintenance of the plant.

Maintenance Technician III — Maintenance Technician responsible for conducting advanced upgrades for existing and new plant.

On-The-Job Training (OJT) — One on One training, where there is one trainer and one trainee.

Paper Instrument — A self-paced information booklet with a self-grading exam(s).

Pedagog — A member of the education profession or function of a teacher/trainer.

Peninsula — Area includes Hampton, Newport News, Poquoson, Williamsburg, York and James City Counties, Virginia.

Plant — The cable system made up of coaxial and fiber cable for Television, Music, High-Speed Data and Telephony.

Refresher Training — Training that is conducted periodically to maintain current knowledge expertise.

Relevant — Pertaining to the levels of training.

Southside — Area includes Chesapeake, Norfolk, Portsmouth, and Virginia Beach, Virginia; Knotts Island, North Carolina.

TSR — Technical Service Representative responsible for maintaining the cable from the tap to the television set.

OVERVIEW OF CHAPTERS

This study looked at whether there was a need for alternative models of training. The models included classroom instruction, one on one OJT, Self-Paced Booklet and the use of computers. A survey was developed to determine whether there are other models of training that may be more productive than the traditional methods, as well as how the training is administered. The following chapter will review the literature on this topic by other writers in the field. Chapter III will present the methods and procedures used in this research. In

Chapter IV, the survey findings are presented. Finally, in Chapter V, the

findings are summarized, and conclusions with recommendations are drawn.

CHAPTER II

REVIEW OF LITERATURE

Realignment of the workforce happens when there is an extensive change in an organization. Procedures and the roles that are played have to be rethought and a new direction or way of conducting training may be favored. Training is an important factor in any realignment process, and especially the scope and timing, if the process is to be effective. When there is participation by everyone concerned, the more quickly they are attuned to the new direction, the sooner they will function as a team. (Conover, 1996, p. 597) Conover goes on to state "training should have as an essential design requirement, speed of delivery." Changing how training is conducted is a reexamination of the philosophical thrust in education as stated by Malcolm Knowles, an innovative leader in adult and continuing education. (1980, p. 18)

This chapter will look at various methods and formats utilized in training. They include: programmed learning, self-directed learning, the benefits of multimedia technology in training, job training, job instruction training, and instructor delivery.

Programmed Learning

B. F. Skinner refers to Programmed Learning as a wide spread method, found especially in Job Skills Training. The main aspect of Skinner's principles of programmed learning is that the trainee receives immediate feedback, or in other words, a positive or negative response. Rush provides an example:

"When a trainee is solving a problem or answering a question, the trainee is usually told the answer is correct, (which is) the desired response, and told to continue (as) the reward. However, if the answer or action is incorrect or insufficient, the instruction is to try again or go back to the previous material, (which is) the punishment. Moreover, until the desired response or actions are given, the trainee may not proceed, and additional material or information is not given." (1996, p. 235) Programmed instruction or programmed learning techniques either apply to the individual or to the group utilizing a variety of instructional methodologies. (1996, p. 235)

Business organizations, of late, have seen an interest in employee reinforcement and behavior modification that is a little different from programmed learning. "Companies are increasing their application of Skinner's techniques to improve on-the-job performance in a systematic way. Employees receive immediate feedback on, and evaluation of, their performance of daily tasks." (Rush, 1996, p. 235) Within any organization, business operations should design their instruction as a vital element, to not only accomplish the needed outcome, but be consistent in content, as well as cost-effective.

"Only of late has this criteria been applied with rigor to training programs. As the demand for results have increased, the search for an efficient, effective instructional system has increased." (Molenda, Pershing, Regeluth, 1996, p. 267)

Self-Directed Learning

Self-directed learning as an instructional design is both effective and efficient. In this discussion, Piskurich defines it "...as a training design in which trainees work at their own pace, without the aid of an instructor to master predetermined material." (1996, p. 453)

Self-directed learning encompasses a variety of activities, such as reading a book to using a computer. This manner of training can fit situations where individualized growth is necessary and the need for similar material that must transpire at numerous locations. The need for consistency and the possible high turnover rate of personnel dictates this.

As a learning style, self-directed learning is the basis for concepts such as self-directed work teams and learning organizations. No matter what you find in a current situation, self-directed learning is likely to fit somewhere in the training and development matrix. (1996, p. 453)

Multimedia Training

In conjunction with self-directed learning, interactive multimedia training is a marriage of audiovisual (AV) media and computer-based training (CBT). These programs are designed to integrate a wide range of media such as graphics, animation, audio, and full motion video so that the content is presented in the best possible way. Since these programs are computer-based or Intranet based, learners can interact with them and go through them in sequence

and depth that meets the programs particular requirements. (Howell and Silvey, 1996, p. 535)

Howell and Silvey go on to indicate that "interactive multimedia training programs move training into the realm of direct-performance improvement making them very important in today's business world. This is particularly true because the global economy is moving from an orientation of production toward an emphasis on converting information to knowledge." (1996, p. 536)

Instructional multimedia refers to applications designed to target specific learning objectives. Studies on the time required to train employees with multimedia and CBT have consistently found a reduction of 30 percent or more over conventional instructor led training. (Fletcher, 1990; Janson, 1992; Ljungstrom and Sorensen, 1993)

Although the initial startup costs are high, multimedia or CBT can be cost effective over time. Fletcher (1990) goes on to state that, "multimedia involves students in active, rather than passive learning through physical interaction and cognitive engagement." (Oblinger 1993; Barron and Orugn, 1995)

Self-directed and multimedia modes of training are forms which allow the trainees to conduct hands-on training as well as perform in a real world situation. This leads into job training.

Job Training

Job training comprises the assignment of a trainee with an experienced employee to learn the particular and precise skills of the job. This takes place

when new hires or those being transferred or promoted or when an individual lacks the knowledge or the skills to accomplish the job. The three most common methods of job training are (1) Structured On-The-Job Training (OJT), (2) Unstructured On-The-Job Training, and (3) Job Instruction Training (JIT).

Structured OJT allows the trainee to gain skills and knowledge required to accomplish the job through a series of structured or planned supervised activities. The elements needed to competently undertake and meet the performance standards as well as the expectations are presented in an organized manner. Most unstructured OJT activities are not completely planned and are done in a casual fashion. A common method of unstructured OJT is to have the trainee shadow another employee to see how the job is accomplished. This method often leads the trainee to pick up as much by trail and error as by any instruction given. The major drawback to an unstructured approach is that objectives, expectations, and outcome are not defined in advance and, therefore, results are unpredictable.

Job Instruction Training (JIT) was first developed during World War II for production workers and was based on mechanical step by step procedures requiring the instructor to present the material in an orderly, disciplined manner. It is not frequently used in teaching motor skills. Since there is a systematic approach to JIT, components of it are often found in today's structured OJT initiatives. (Nolan, 1996, p. 748)

Instructor Delivery

In the instructor led or lecture model, a major role of the trainer is to establish an atmosphere or to set the learning climate in which people are ready to participate and learn. This does not necessarily mean that everyone is committed to being an active participant. It does mean that most participants are in an open and cooperative frame of mind, are not distracted, and are serious about their time and intellectual resources. (Robbin, Doyle, Orandi and Prakop, 1996, p. 779)

SUMMARY

Self-directed learning is an independent study method allowing trainees the opportunity to learn without the direct assistance of an instructor. Davies refers to the suggestion that trainees can learn more when they are allowed to do it on their own instead of sitting in a required class. (1981, p. 47)

Another form of self-directed learning that was discussed was programmed learning. It provided immediate feedback as a reward and punishment method. Further, multimedia training was introduced which incorporates AV material combined with CBT. Each of these models allows the trainees to learn at their own pace.

Job training introduced three types of OJT: structured, unstructured, and JIT. Lastly, the instructor led or lecture model dealt with how setting the atmosphere is necessary for active participation in a classroom.

Chapter III will describe the method and procedures how this research was conducted. It will outline the instrument used to collect the data as well as describing the statistical methods utilized to analyze the data.

CHAPTER III

METHODS AND PROCEDURES

Chapter III will explain the instrument used for the population surveyed, collection of data, and the process for achieving statistical results. This chapter will outline how the research was planned for this study.

POPULATION

The population incorporated forty Maintenance Technician II's and Maintenance Technician III's located on both the Southside and the Peninsula of the Cox Communications Hampton Roads service area. Maintenance Technicians maintain both the coaxial and fiber cable associated with cable television, music, high-speed data transmissions, and telephony.

INSTRUMENT DESIGN

The instrument used was a survey with questions and Likert scales for ranking responses. The responses were separated into the following groups:

1)   Type of model per training occasion.

2)   Type of format per training model and occasion.

3)   Administration and management aspects for training.

A sample of the instrument can be found in Appendix A.

METHODS OF DATA COLLECTION

The purpose of this study was to determine the appropriate training models and formats for training Maintenance Technicians II's and III's for Cox

Communication Hampton Roads. On May 13, 1998, a cover letter (Appendix B) explaining the reason for the study, along with a copy of the survey (Appendix A), was sent to each Maintenance Technician in Hampton Roads. The letter included a request to return the survey no later than May 15, 1998.

STATISTICAL ANALYSIS

Questions listed on the survey are analyzed combining Southside and Peninsula as well as Maintenance Technician II and III using frequency of responses and percentages. Some of the questions are compared between the Southside and the Peninsula Maintenance Technicians as well as between Maintenance Technician II and III using Chi-Square to determine whether the respondents deviate significantly. (Isaac & Michael, 1995, p. 184)

SUMMARY

Chapter III presented the methods and procedures utilized for this study. The population of forty Maintenance Technicians from the Cox Hampton Roads service area was provided a survey that was developed which included sixteen questions. Upon the completion of the survey, it was collected, the questions and scales were tabulated and analyzed individually and compared between various frameworks using frequency, percentages and chi-square statistical procedures. Chapter IV presents the results of the data collected.

CHAPTER IV

FINDINGS

This chapter will report the findings of this research study. The problem of this study was to determine the appropriate models and formats for training Maintenance Technicians for Cox Communications Hampton Roads.

The survey consisted of a series of questions concerning the manner in which Maintenance Technicians are trained in the performance of their duties. A cover letter attached to the survey introduced an explanation of the study and encouraged each Maintenance Technician to participate.

The research instrument was developed on three goals. These included:

1. Determine an appropriate training model for Maintenance Technicians II and III per training occasion.

2. Determine an appropriate training format for Maintenance Technicians II and III per training occasion and model.

3. Determine the appropriate administrative and management aspects of the training models and formats for Maintenance Technicians.

The survey was sent to forty Maintenance Technicians in the Cox Communications Hampton Roads area of which twenty-seven responded resulting in 67.5% of the population.

Training Models

The four models being researched include OJT, Refresher, Job Instruction Training, and Lecture. Questions One through Three asked which model would be appropriate for Computer-Based, Lecture, Self-Paced Booklet, and One on One Training. The results of the data collected follows.

Question One, which asked to select the appropriate model for "On the Job Training," is dispersed equally between Selections D and E. Selection D, One on One Training, had a response rate of 52% while selection E, "Create your own Combination" was reported at a 48% response rate as is shown in Figure 1. Of the combination of choices in selection E, the respondents created the existing combination of Lecture and One on One Training with 38%.

Figure 1 — On The Job Training (OJT)
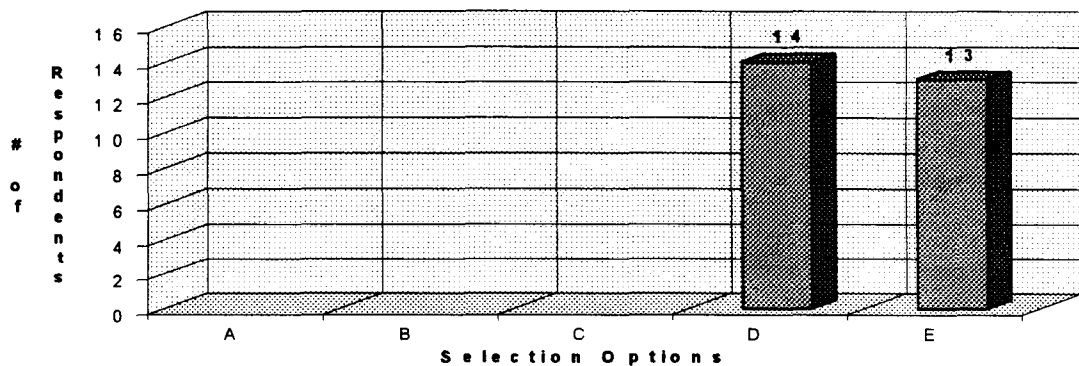
Question Two, asked to select the appropriate model for Refresher Training. Selection E, "Create your own combination," was chosen by 44% of the responding population, while selection B, Lecture, received 33% of the respondents choices, as depicted in Figure 2. Within selection E, which held the

majority of the selections, respondents chose the combination of Lecture and a

Self-Paced Booklet at a 42% response rate.

Figure 2 — Refresher Training
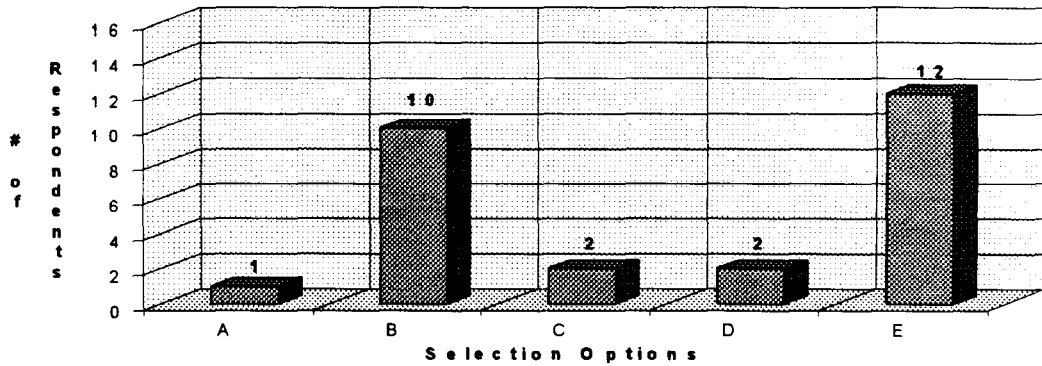
Question Three, asked to choose the appropriate model for Job Instruction

Training. The Lecture model, selection B, was chosen by 44% of the population

responding, while selection E, "Create your own combination" was reported at

33%, as shown in Figure 3. Within selection E, the combination of Lecture and

Self-Paced Booklet was selected by 33% of those responding.

Figure 3 — Job Instruction Training
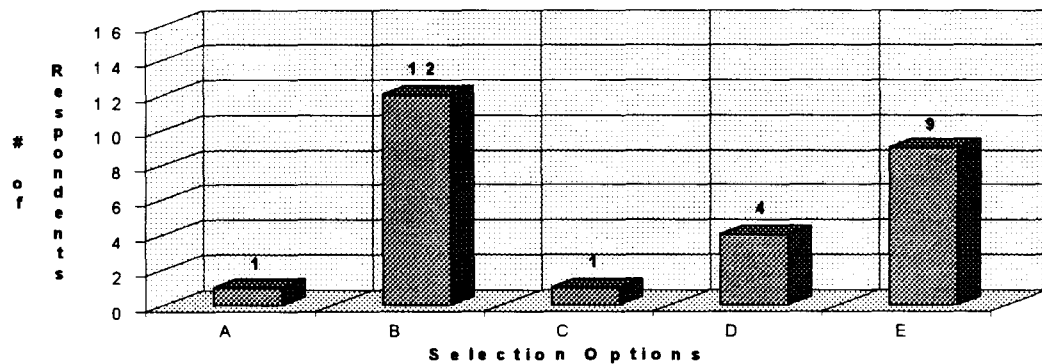
Training Formats

The three training formats being researched include Computer-Based

Training, Self-Paced Booklet, and One on One Training. Questions Four through

Eight asked which model would be appropriate for OJT, Refresher, Job

Instruction Training, and Lecture.

Question Four asked to compare three of the four models and select

which model would benefit the most from the use of a computer. Figure 4,

shows that selection D, All, received 12 choices resulting in a majority at a 44%

response rate.

Figure 4 — Benefit from Computers
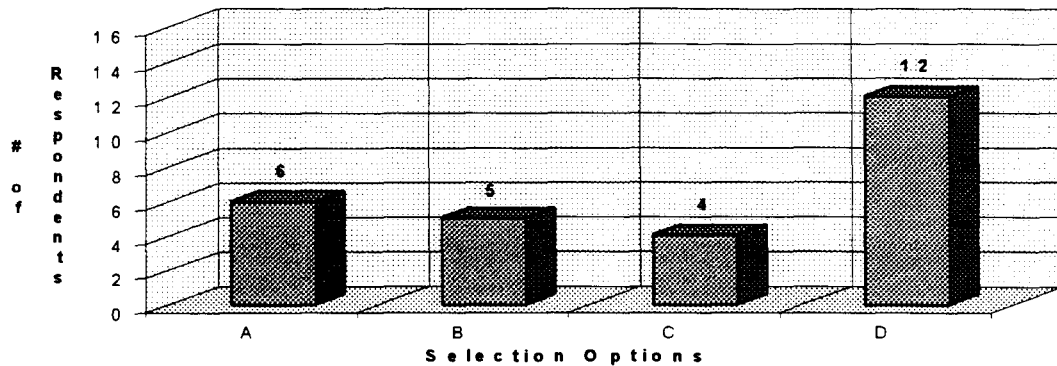
The use of a Self-Paced Booklet is distributed across each of the models,

including All, as related in Question Five. However, the majority selected

Refresher Training, selection B, at a rate of 37%. While selection D, which asked

to choose All, had a 30% response rate, indicating that the use of a Self-Paced

Booklet would be beneficial for all three formats, OJT, Refresher, and JIT, as

shown in Figure 5.

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Figure 5 — Self-Paced Booklet
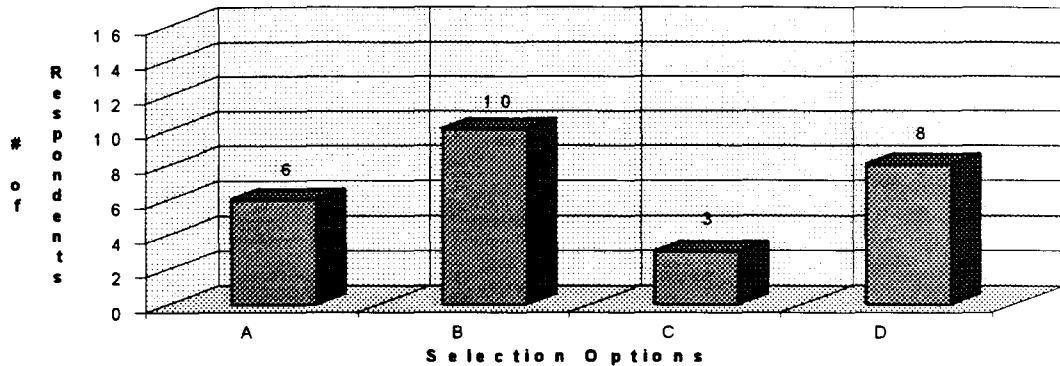
Figure 6 displays the results for Question Six. It asked to compare the

training models and select the model that would benefit the most from One on

One Training. Selection A, OJT, was the chosen by 81% of the respondents.

Where selection D, All, scored with a response frequency of 15%.

Figure 6 — OJT
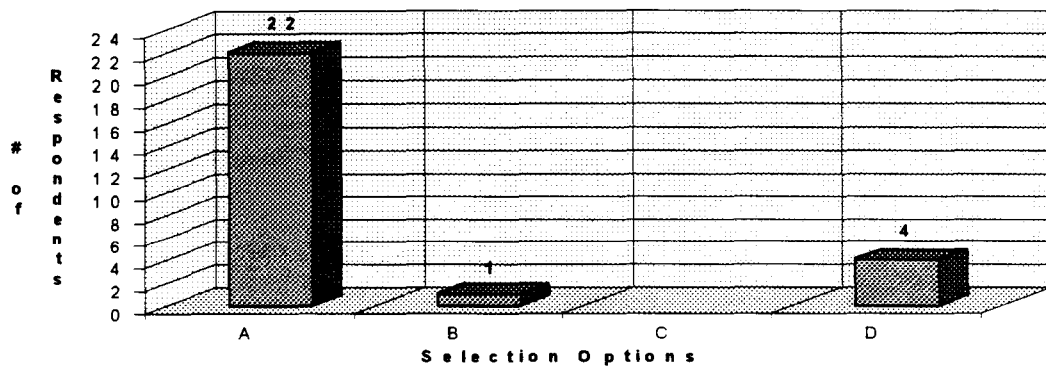
Figure 7 illustrates the choices for Overall Training of Maintenance

Technician II's as asked in Question Seven. The data indicates that 55% of those

responding to the survey affirm that all three formats would be beneficial for

their overall training. While, OJT, selection A, on its own resulted in a 41%

response rate.

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Figure 7 — Overall Training for Maintenance Technician II
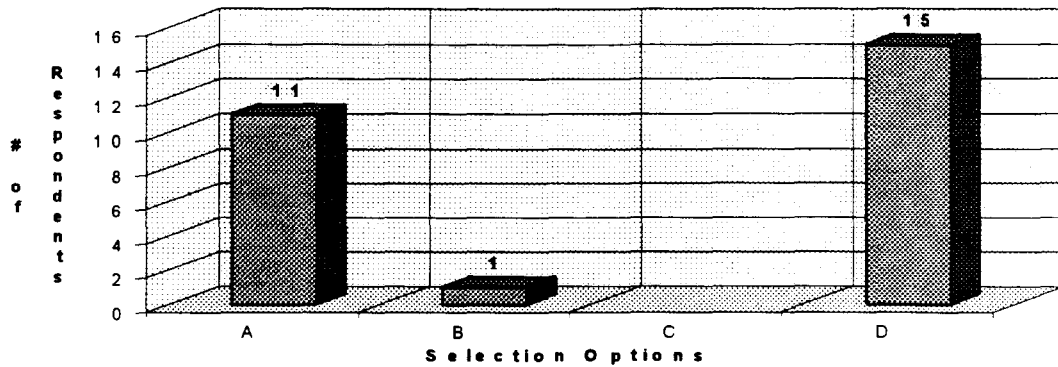
When comparing between the Southside and the Peninsula in Question

Seven regarding the Overall Training for Maintenance Technician II's, the

responses displayed an opposite in selections as viewed in Figure 8. Selection A

showed a difference in frequency of five choices, favoring the Peninsula with

37.5% of the respondents. Where Selection D showed a difference of three

choices, favoring the Southside with a 67% response rate.

Figure 8 — Comparison for Tech II Overall Training
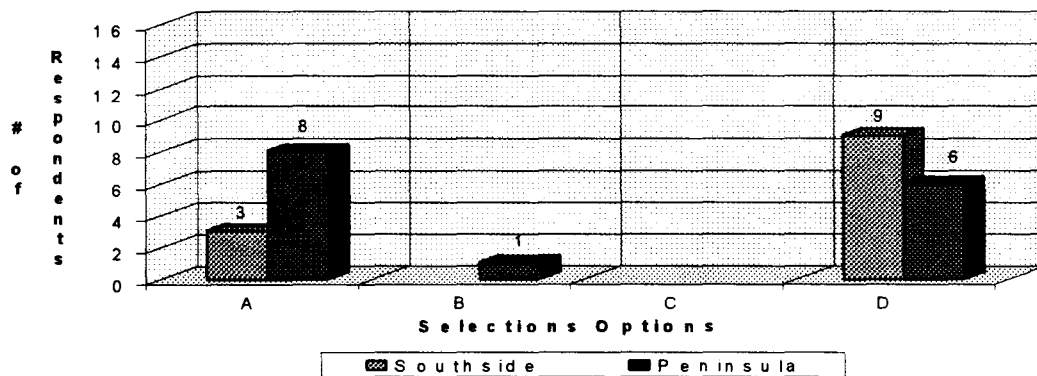
Figure 9, portrays Chi-Square, resulting in a statistical difference of .001352 as

reported at the .01 level between the Southside and the Peninsula regarding their

Overall Training.

Figure 9 — Chi-Square for Overall Training

Area	Selection	
	A	D
S	3	9
P	8	6

$$X^2= \frac{26((9X8)-(3X6))^2}{(6+9)X\ (3+8)X(3+9)X(8+6)}$$

$$= 0.001352$$

Figure 10 reflects how the respondents chose their selections for Overall

Training for Maintenance Technician III's as asked in Question Eight. The data

shows that 59% of those responding chose all three formats denoting each format

would be beneficial for their overall training. While OJT alone, selection A,

received a response rate of 37%.

Figure 10 — Overall Training for Maintenance Technician III

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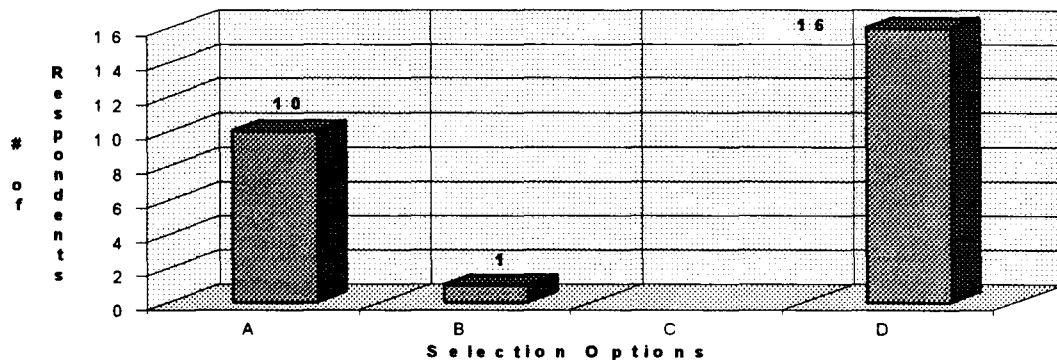
Administration of Training

Questions Nine through Sixteen asked various aspects of how the training

should be administered and managed. Question Nine, asked whether a trainee

should ride with more than one trainer during their training period. The

majority of the responses of the population answered yes, at 85%, indicated in

Figure 11.

Figure 11 — Multiple Trainers per Trainee
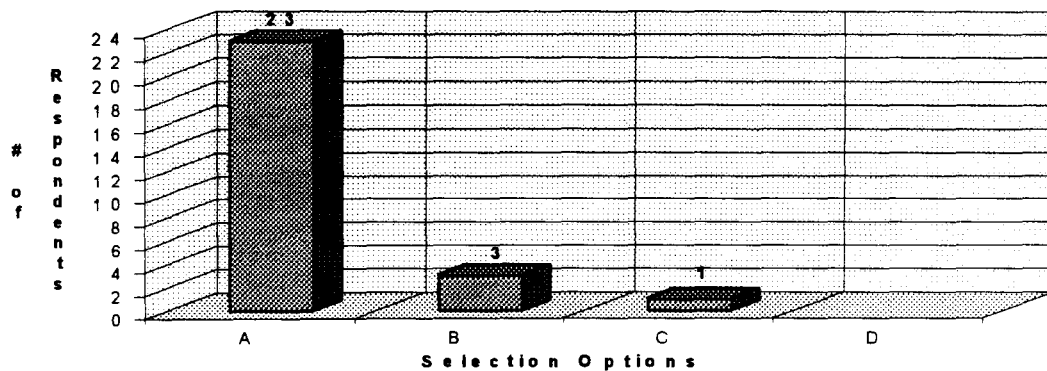
The amount of time that should be spent with each trainer during OJT

was asked in Question Ten for Maintenance Technician II, and Question Twelve,

for Maintenance Technician III. The results in Figure 12 reveal 56% of those

responding chose selection C, four weeks, for Maintenance Technician II, and

four weeks for Maintenance Technician III's resulting in a 37% response rate.

Figure 12 — Minimum Time w/Trainer, Comparison
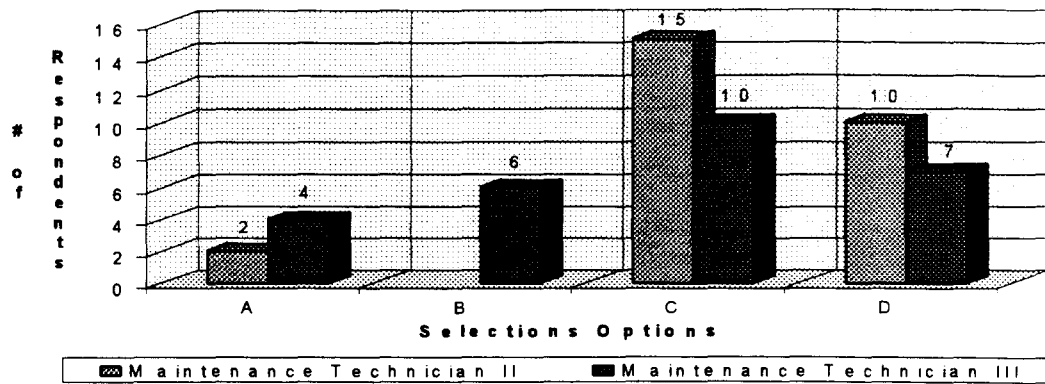
Figure 13 illustrates a statistical difference, using Chi-Square, of .001369 at

a .01 level between the Southside and Peninsula Maintenance Technicians when

asked in Question Ten, how much time should be spent with a trainer during

OJT.

Figure 13 — Chi-Square for Minimum Time w/Trainer

	Selection	
Area	C	D
S	5	6
P	10	4

$$X^2= \frac{25((6 \times 10)-(5 \times 4))^2}{(6+5) \times (4+10) \times (6+4) \times (5+10)}$$

$$= 0.001369$$

Question Eleven asked what should be the minimum total training time

for Maintenance Technician II. While Question Thirteen asked the same for

Maintenance Technician III's. The majority for both questions was answered

with a choice of six weeks, indicating a result of 41% for Maintenance Technician

II's and 56% for Maintenance Technician III's, as viewed in Figure 14.

Figure 14 — Total Training Time

Maintenance Technician II   Maintenance Technician III
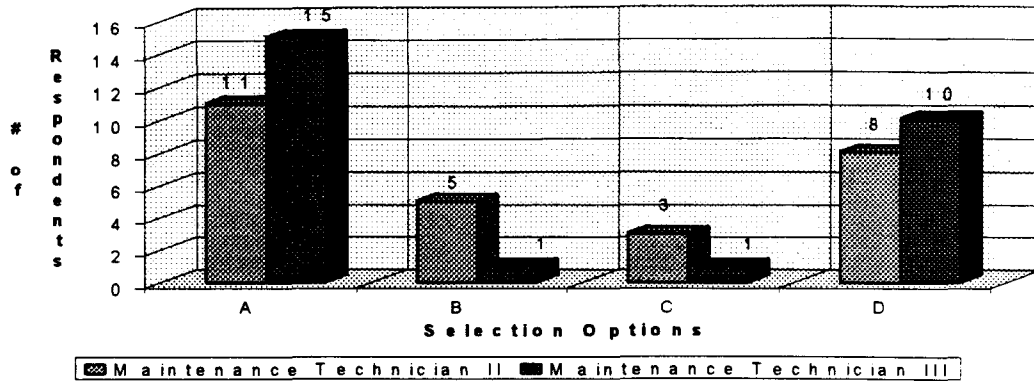
Question Fourteen asked how are trainees to demonstrate their

proficiency achieved during training to certify them as Maintenance Technicians.

The results from this survey, as viewed in Figure 15, exhibited that of those

responding the use of a combination of applications would be appropriate for

evaluating their training success. Selection E had a 37% response rate where the

combination of Oral Questions included with a Practical Test is administered to

trainees.

Figure 15 — Qualifications
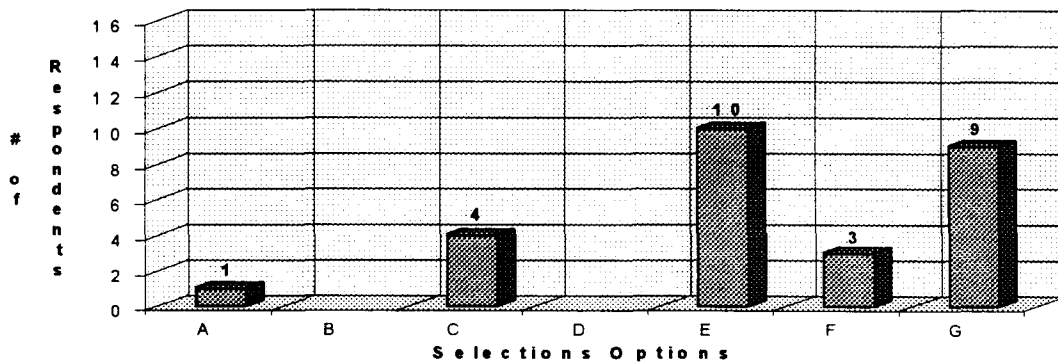
Table 1 illustrates the number of responses and percentages per choice for

Question Fourteen. The choices represent how the Maintenance Technicians

chose qualification methods for the manner in which a trainee should be tested

to demonstrate they are qualified as a Maintenance Technician. Oral

Questioning only had one selection, with a 4% response rate, while Practical

Testing had six selections, or 15% of the responding population. In addition, the

combination of choices revealed selections that were more popular. Oral

Questioning combined with a Practical Test was selected the most with 10

responses, equaling a response rate of 37%. There were, however, 3 selections,

or 11% of those responding, selecting the combination of a Written and Practical

Test. Moreover, the choice of using all three, Oral Questions, Written Test, and a

Practical Test, received 9 selections equaling a 33% response rate from the

population.

Table 1 — Competency Evaluation

a)	Oral Questions	1	4%
b)	Written Test		
c)	Practical Test	4	15%
d)	Both, A and B		
e)	Both, A and C	10	37%
f)	Both, B and C	3	11%
g)	A, B, and C	9	33%

Question Fifteen asked how often should a Maintenance Technician re-

qualify in order to maintain their job expertise or efficiency. As Maintenance

Technicians perform their duties, they are independent, with no immediate

supervision. As experience levels increase, so does the quantity of task

accomplishments. For an example, certain tasks are necessary in a few isolated

situations that are not performed on a regular basis; thusly their knowledge and

performance may fall short. The respondents showed 48% selected an annual re-

qualification, as seen in Figure 16.

Figure 16 — Re-Qualification
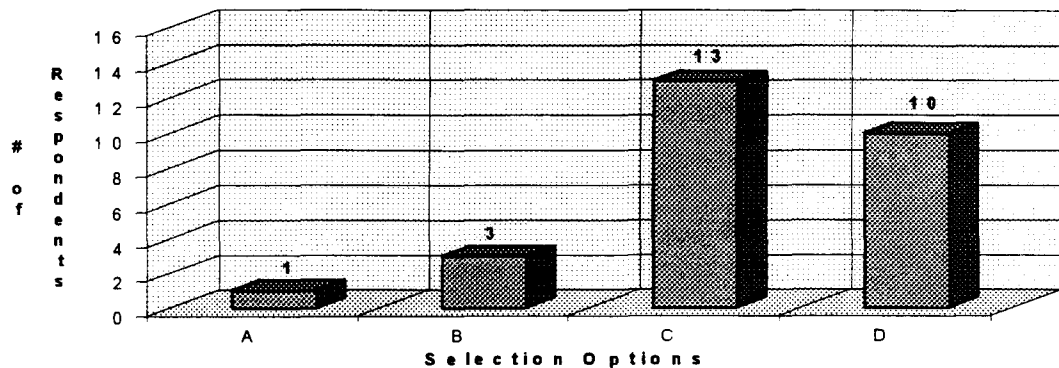
Question Sixteen asked whether employees being transferred into

Maintenance should retake the Tech II class. This class is provided periodically

to assist in the preparation of an employee to become a Maintenance Technician

II. Employees desiring to become a Maintenance Technician II enroll in the Tech

II class and must successfully complete the class to become eligible for

consideration as a Maintenance Technician. However, position posting for a

Maintenance Technician II may be several months to several years after the

completion of the class. The responses were equally distributed between the

choice of Yes and No for the attendance of a refresher Tech II class to reacquaint

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their knowledge and skills prior to starting training within maintenance, as

viewed in Figure 17.

Figure 17 — Tech II Class
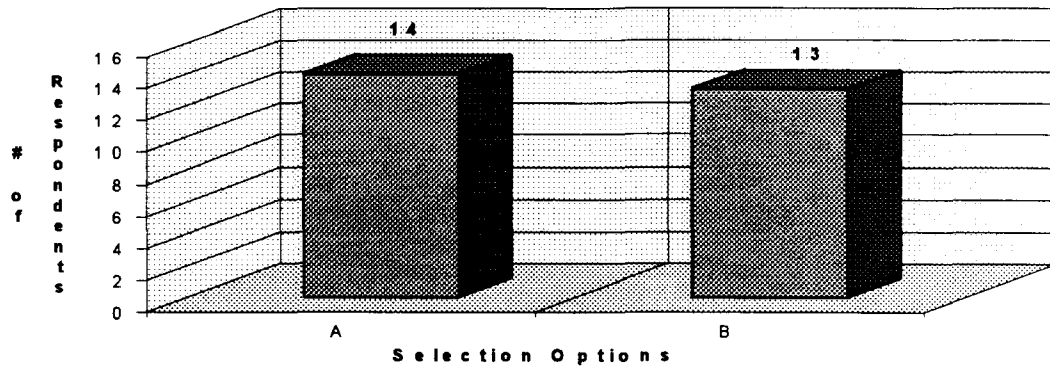
CONCLUSION

Chapter IV presented the data from 67.5% of the population. The raw

data was collected and summarized. Two of the questions were compared

between Maintenance Technician II and III, while another question was

compared between the Southside and the Peninsula. The areas addressed were

in choosing an appropriate model for various training occasions, as well as

selecting an appropriate training format for the model and occasions.

Additionally, the respondents chose how the training should be administered

and managed for the various models, formats, and occasions. Chapter V will

summarize the research, draw conclusions, and make recommendations based

on these findings.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY

The problem of this study was to determine the appropriate models and
formats for training of the Maintenance Technicians of Cox Communications
Hampton Roads. To address this problem, a survey was created and distributed
to a population of forty Maintenance Technicians.

This study reviewed how the incorporation of four training models and
three formats into the training procedures could enhance the training for
maintenance technicians. The findings were based on 67.5% of the population
surveyed, indicating a need for change in how they are trained.

CONCLUSIONS

Based on the data assembled, the following conclusions were made for
each of the research goals. Research Goal 1 asked to determine an appropriate
training model, per training occasion, for Maintenance Technicians.

The data reported that each model discussed has its place within the
organization. On-the-Job-Training must remain, however, with some changes.
The model Job Instruction Training, a new term for the existing Lecture format,
may be better used to introduce new procedures and equipment. Furthermore,
the model of Refresher Training was highly accepted as an addition to training,
which can be coordinated and adapted for use with Computer-Based Training,
Lecture, and Self-Paced Booklet models.

Research Goal 2 asked to determine an appropriate training format per training occasion and model for Maintenance Technicians. The assembled data disclosed that the formats of Computer-Based Training and Self-Paced Booklets could be applied to each model. This could further be interpreted to mean that Self-Directed Learning incorporated with Multimedia is a favored choice for learning. With regards to their overall training, each format can be combined in various formats depending on the occasion that requires the training.

Research Goal 3 asked to determine the appropriate administration and management aspects of the training models and formats for Maintenance Technicians. The practice of having trainees ride with more than one trainer was accepted by 85% of those surveyed. This gives trainees a more diverse indoctrination of how tasks are accomplished allowing them to assemble skills from more than one trainer, formulating their own characteristics. The survey also revealed that a trainee should ride with each trainer for at least four weeks. However, the level of expertise the trainees bring to training really dictates how long they will need for training.

When trainees complete their training, the manner in which they demonstrate their knowledge of the material is distributed rather evenly across two choices. The combination of using both Oral Questions and a Practical Test received 37%, while 30% selected all three, which included Oral Questions, a Written and a Practical Test. Additionally, of those surveyed, they were divided

between having a newly hired Maintenance Technician II's take a refresher Tech II class before reporting for training.

RECOMMENDATIONS

Based on these conclusions, training for both Maintenance Technician II and III can be enhanced by utilizing Computer-Based Training as well as Self-Paced Booklets incorporated with the addition of annual Refresher Training. Regarding Job Instruction Training, the utilization of the existing Lecture format is still preferred. Moreover, the employment of multiple trainers for OJT is notably favored. In order to progress towards the enhancement of training, the following recommendations are made:

1. Establish written procedures for the training of new Maintenance Technician II and III.

   - Establish a track or systematical agenda for qualifying job skills.

   - Formulate a rotation for trainers to have a trainee ride for no more than two weeks at a time.

   - Substantiate the criteria for administering the training program and develop tracking methods to ensure the progress of each trainee.

   - Develop evaluation tests for various stages of training. This will evaluate the trainees progress throughout their training highlighting strong and weak areas.

2. Create CBT and Self-Paced Booklets for use in Refresher Training.

- Have material available for use on an "as needed" basis for reference purposes and scheduled to enhance and maintain job skills.

3. Create a Refresher Tech II class.

- Develop a refresher Tech II class to be administered upon selection as a Maintenance Technician II. This will allow the Maintenance Technician II trainers to conduct more hands on training and only quizzing the theory instead of re-addressing the material that was covered in the Tech II class. This would be an excellent opportunity to incorporate CBT.

4. Establish an area at each Service Center with actual working equipment set up in a mock plant arrangement for practical hands on training and testing.

- This equipment would allow hands-on practical testing, scheduled training, as well as trouble-shooting practice in a controlled environment.

5. Consider outside sources for education.

- Outside sources are an additional means of education utilized to enhance knowledge and expertise.

6. Conduct customer interaction training regularly.

- To ensure when Maintenance Technician's make customer contact there is a continued professional interaction.

7. Establish criteria for the trainers.

- Determine the minimum experience time before assigning a Maintenance Technician as a trainer.

- Establish a "Train the Trainer" session. This will establish guidelines and mannerisms on proper in-field training.

Based on this study, enhanced Maintenance Technician Training will promote better-trained technicians in a more efficient, controlled, and expeditious manner. It will identify the abilities of new trainees more quickly and ascertain their compatibility within each area of Maintenance, as well as create a fluid transition. The results of this study supports the introduction of established training procedures for new Maintenance Technicians and the progression to Maintenance Technician III. Additionally, continuous training is necessary to maintain the proficiency and professionalism of the Cox Communication Hampton Roads Maintenance Technicians and will enhance their overall performance and the service provided to the customers.

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APPENDIX A

Cox Communications Hampton Roads

Maintenance Technician   II   or   III (circle one)

Location: Southside or Peninsula (circle one)

Purpose: This survey will help to discover your thoughts on determining the appropriate training format for the various training models. In addition, this survey will assist in identifying a standard time frame in which to conduct training.

Instructions: Circle the appropriate letter that indicates your choice in the multiple-choice questions. When asked to rank a question, circle the number that corresponds to your thoughts.

1	2	3	4	5
Most Significant	Significant	Uncertain	Insignificant	Most Insignificant

TRAINING MODELS

Computer based: A computer based program that delivers information systematically with the use of video, audio, graphics, with questions and answers relating to the topic, available on your time.

Lecture: A program set in a classroom with an instructor that lectures and/or shows information and using hands on training at scheduled times.

Self-Paced Booklet: A booklet that delivers information systematically with the use of photographs, graphics, with questions and self-grading answers relating to the topic, completed on your time.

One on One Training: A pairing of an experienced Maintenance Technician with an less experienced Maintenance Technician conducting training one on one.

1. Select the appropriate type of training for "On the Job Training (OJT)."
    (OJT allows a trainee to acquire skills and knowledge needed to perform the job through a series of structured or planned supervised activities.)
    a)   Computer based
    b)   Lecture
    c)   Self-Paced Booklet
    d)   One on One Training
    e)   Create your own combination _____

Based on your answer, please rank the preferred level for your choice.

1	2	3	4	5

2. Select the appropriate type of training for Refresher Training.
    (Refresher training is training that is conducted periodically covering material that may or may not be routine in nature, maintaining the same knowledge level for all.)
    a) Computer based training
    b) Lecture
    c) Self-Paced Booklet
    d) One on One Training
    e) Create your own combination _____
    Based on your answer, please rank the preferred level for your choice.

1	2	3	4	5

3. Select the appropriate type of training for Job Instruction Training (JIT).
    (Job Instruction Training is training delivered in a systematic manner in an as needed basis, another form of OJT)
    a) Computer based training
    b) Lecture
    c) Self-Paced Booklet
    d) One on One Training
    e) Create your own combination _____
    Based on your answer, please rank the preferred level for your choice.

1	2	3	4	5

TRAINING FORMAT

4. Compare each of the training models and select the one, which would benefit you the most from use of the computer.
    a) OJT
    b) Refresher
    c) JIT
    d) All

5. Compare the training models and select which model would benefit you the most from use of a Self-Paced Booklet.
    (**Self-Paced Booklet**: A booklet that delivers information systematically with the use of photographs, graphics, with questions and self-grading answers relating to the topic, completed on your time.)
    a) OJT
    b) Refresher
    c) JIT
    d) All

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6. Compare the training models and select which model would benefit you the most from use of the One on One Training.

> (**One on One Training**: A pairing of an experienced Maintenance Technician with an less experienced Maintenance Technician conducting training one on one .)

   a) OJT
   b) Refresher
   c) JIT
   d) All

7. Compare the training models and select which model would be most effective in overall training of Maintenance Technician II's.
   a) OJT
   b) Refresher
   c) JIT
   d) All

8. Compare the training models and select which model would be most effective in overall training of Maintenance Technician III's.
   a) OJT
   b) Refresher
   c) JIT
   d) All

ADMINISTRATIVE/MANAGEMENT ASPECTS

9. During One on One training, should new Maintenance Technicians II or III ride with more than 1 trainer?
   a) Yes
   b) No
   c) Does not matter

10. For new Maintenance Technician II's, what is your recommendation for the **minimum** length of time trainees should ride with trainer(s).
   a) 2 weeks
   b) 3 weeks
   c) 4 weeks
   d) Other _____

11. If a new Maintenance Technician II rides with more that one trainer, what is your recommendation for the minimum length of time they should ride for their <u>TOTAL</u> training time.
   a)   6 weeks
   b)   8 weeks
   c)   12 weeks
   d)   Other _____

12. For new Maintenance Technician IIIs, what is your recommendation for the **minimum** length of time trainees should ride with trainer(s).
   a)   2 weeks
   b)   3 weeks
   c)   4 weeks
   d)   Other _____

13. If a new Maintenance Technician III rides with more that one trainer, what is your recommendation for the minimum length of time they should ride for their <u>TOTAL</u> training time.
   a)   6 weeks
   b)   8 weeks
   c)   12 weeks
   d)   Other _____

14. How would you determine when the new Maintenance Technician II or III is ready to go it alone?
   a) Oral Questions   d)   Both, A and B
   b) Written test   e)   Both, A and C
   c) Practical test   f)   Both, B and C
                                  g)   A, B, and C

15. How often should Maintenance Technicians re-qualify their position to maintain their expertise?
   a)   Every 3 months
   b)   Every 6 months
   c)   Annually
   d)   Other _____

16. Should Maintenance Technician II's retake the Tech II class before being transferred into Maintenance?
   a)   Yes
   b)   No

Comments: _____

_____

_____

_____

_____

_____

_____

**Thank you for providing your responses to the training within Maintenance
at
Cox Communications Hampton Roads**

APPENDIX B

May 13, 1998

Dear Maintenance Technicians,

Training is a very vital part of the inner workings of maintaining the plant for Cox Communications, Hampton Roads. As I have matured within the department, I have also seen how maintenance is conducted, gaining an interest in how "Maintenance" grows.

This survey is designed to gather your thoughts on how you anticipate the training for new and existing Maintenance Technician, both II's and III's, be standardized. This survey is part of my graduate degree that I am pursuing at Old Dominion University. Please take a few minutes to complete the attached survey and return it to me by Friday, May 15, 1998. If you have any questions please feel free to contact me in person or leave a message at 497-1071 extension 7919.

Thank you for your participation in this survey.

Sincerely,

Joel P. Horner   Dean Kinzel