



**ARMY POLYTECHNIC SCHOOL**

**DEPARTMENT OF LANGUAGES**

**DISTANCE EDUCATION**

**APPLIED LINGUISTIC MAJOR**

**RESEARCH PROJECT**

**“The incidence of the Personnel’s English Reading Comprehension Level on the Application Process of the FAR\_145 in The Electronics Maintenance Center of Guayaquil during the months of June and July, 2007”**

**BY**

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**Rennan F. Cardenas C.**

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**Alonso R. Ortega A.**

## **DEDICATION**

This work is specially dedicated to my lovely wife Ruby, and my dear daughters Ma. Fernanda and Renata, who are the torch that illuminates my life and are always my support.

It is also dedicated to all my family and friends and all those who has want to grow up every day in their professional lives, as well.

**Rennan F. Cardenas C.**

This thesis is dedicated to my parents and my love Andrea, who have supported me all the way since the beginning of my studies.

Also, this thesis is dedicated to all those who work in the Aeronautics Area and believe in Ecuador helping each day to enlarge our aeronautical industry.

**Alonso R. Ortega A.**

## INDEX

<b>ACKNOWLEDGEMENTS.....</b>	<b>I</b>
<b>DEDICATION.....</b>	<b>II</b>
<b>APPROVAL SHEET.....</b>	<b>III</b>
<b>INDEX.....</b>	<b>IV</b>
<b>SUMMARY.....</b>	<b>7</b>
<b>INTRODUCTION.....</b>	<b>9</b>
<b>RESEARCH THEME.....</b>	<b>11</b>
<b>PART I.....</b>	<b>12</b>
<b>RESEARCH PROBLEM.....</b>	<b>12</b>
1.1. Problem Identification.....	12
1.2. Problem Setting.....	15
1.3. Variables working out.....	15
1.3.1. Independent Variable.....	15
1.3.2. Dependent Variable.....	15
1.4. Conceptualization and Operationalization of Matrix Variables.....	16
1.5. Objectives.....	21
1.6. Justification.....	22
<b>PART TWO.....</b>	<b>25</b>
<b>THEORETICAL FRAMEWORK.....</b>	<b>25</b>
2.1. Theoretical and Conceptual Focus.....	25
2.2. Structure.....	26
<b>CHAPTER I.....</b>	<b>26</b>
1.1. Reading Comprehension.....	26
1.1.1. Microprocesses.....	26
1.1.2. Integrative Processes.....	27
1.1.3. Macroprocesses.....	28
1.1.4. Elaborative Processes.....	29
1.1.5. Metacognitive Processes.....	30
<b>CHAPTER II.....</b>	<b>31</b>
2.1. Federal Aviation Regulation Part 145_Repair Stations.....	31
Subpart A—General.....	32
§ 145.1 Applicability.....	32
§ 145.3 Definition of terms.....	32
§ 145.5 Certificate and operations specifications requirements.....	33
Subpart B—Certification.....	33
§ 145.51 Application for certificate.....	33
§ 145.53 Issue of certificate.....	33
§ 145.55 Duration and renewal of certificate.....	34
§ 145.57 Amendment to or transfer of certificate.....	34
§ 145.59 Ratings.....	34
§ 145.61 Limited ratings.....	36
Subpart C—Housing, Facilities, Equipment, Materials, and Data.....	37
§ 145.101 General.....	37
§ 145.103 Housing and facilities requirements.....	37
§ 145.105 Change of location, housing, or facilities.....	38

§ 145.107	Satellite repair stations.....	38
§ 145.109	Equipment, materials, and data requirements.....	39
Subpart D	—Personnel.....	39
§ 145.151	Personnel requirements.....	39
§ 145.153	Supervisory personnel requirements.....	39
§ 145.155	Inspection personnel requirements.....	40
§ 145.157	Personnel authorized to approve an article for return to service.....	40
§ 145.159	Recommendation of a person for certification as a repairman.....	40
§ 145.161	Records of management, supervisory, and inspection personnel.....	41
§ 145.163	Training requirements.....	41
§ 145.165	Hazardous materials training.....	41
Subpart E	—Operating Rules.....	41
§ 145.201	Privileges and limitations of certificate.....	41
§ 145.203	Work performed at another location.....	42
§ 145.205	Maintenance, preventive maintenance, and alterations performed for certificate holders under parts 121, 125, and 135, and for foreign air carriers or foreign persons operating a U.S.-registered aircraft in common carriage under part 129.....	42
§ 145.206	Notification of hazardous materials authorizations.....	43
§ 145.207	Repair station manual.....	43
§ 145.209	Repair station manual contents.....	44
§ 145.211	Quality control system.....	44
§ 145.213	Inspection of maintenance, preventive maintenance, or alterations.....	44
§ 145.215	Capability list.....	45
§ 145.217	Contract maintenance.....	45
§ 145.219	Recordkeeping.....	46
§ 145.221	Service difficulty reports.....	46
§ 145.223	FAA inspections.....	47
CHAPTER III	.....	47
3.1.	Metacognition and Reading to Learn.....	47
3.2.	Gaining Knowledge by Reading.....	50
3.3.	Reading to Learn Text.....	51
3.4.	Defining comprehension.....	53
2.3.	Hypothesis System.....	58
2.3.1.	Alternative Hypothesis.....	58
2.3.2.	Null Hypothesis.....	58
<b>PART THREE</b>	.....	<b>59</b>
METHODOLOGICAL DESIGN	.....	59
3.1.	Research Type and Design.....	59
3.2.	Population and Sample.....	60
3.3.	Field Work.....	60
3.4.	Instruments for the Collection.....	61
3.5.	Processing and Analysis.....	61
<b>PART FOUR</b>	.....	<b>62</b>
TESTING THE HYPOTHESIS	.....	62
4.1.	Graphical exposition of results.....	62
4.1.1.	FAR 145 Test Results.....	62

4.1.2. Reading Comprehension Test Results.....	78
4.2. Analysis of Results.....	95
4.3. Conclusions.....	100
4.4. Recommendations.....	102
<b>PART FIVE.....</b>	<b>104</b>
THE PROPOSAL.....	104
5.1. Introduction.....	105
5.2. General Objective.....	105
5.3. Specific Objective.....	105
5.4. What is Teaching for Understanding?.....	105
5.4.1. Epistemological base of Teaching for Understanding.....	106
5.4.2. Psychological Base of Teaching for Understanding.....	107
5.4.3. Sociological Base of Teaching for Understanding.....	110
5.5. Planning for Teaching for Understanding. Lesson Plans.....	111
5.6. PROPOSED MANUAL.....	120
1. GENERAL.....	120
2. HOW TO USE THIS MANUAL.....	121
3. TYPOGRAPHIC CONVENTION.....	121
4. RSM ORGANIZATION.....	122
5. RECORD OF REVISION.....	122
6. GLOSSARY.....	124
7. DOCUMENT CONTROL.....	127
8. IDENTIFICATION AND CONTROL.....	128
9. INITIAL DISTRIBUTION.....	129
10. REVISIONS.....	129
11. ORGANIZATION AND MANAGEMENT.....	131
12. DUTIES AND RESPONSIBILITIES.....	133
13. PERSONNEL.....	141
14. DESCRIPTION OF OPERATIONS.....	143
15. HOUSING AND FACILITIES.....	149
16. CAPABILITY LIST.....	154
17. TRAINING PROGRAM.....	156
18. WORK PERFORMED AS ANOTHER LOCATION.....	158
19. CONTRACT MAINTENANCE.....	160
20. RECORD AND RECORDKEEPING.....	161
<b>BIBLIOGRAPHY.....</b>	<b>166</b>
<b>ANNEXES.....</b>	<b>168</b>
TEST ABOUT FAR 145-REPAIR STATIONS.....	168
READING COMPREHENSION TEST.....	173
T-STUDENT DISTRIBUTION TABLE.....	178

## **SUMMARY**

This paper provides an overview of the of the investigation related to a Basic Research of second language reading to assess CEMEFA (Air Force Electronics Maintenance Center) personnel's proficiency at reading comprehension English level in order to determine its incidence in applying the Federal Aviation Regulations Part\_145. A Descriptive Research was use and the test was the technique applied for gathering data.

Chapter One presents the Research Problem, including the problem identification, its variables, general and specific objectives, and the justification of the research.

Chapter Two offers the theoretical frame, where the structure of Reading Comprehension and Federal Aviation Regulation Part 145 Repair Stations are the essence.

The Methodological Design is described in Chapter Three, with the Research Type, Population, Instruments for collecting data and their processing.

The Administrative Framework is covered in Chapter Four as Human and Physical Resources, Budget, Chronological Distribution, Bibliography and Annexes.

Chapter Five begins testing the hypothesis where tests results are exposed. Each question and answer, one by one, counting in the tests has its own graphic result, and a general one is included. This chapter also contains the Analysis of Results with the statistical calculation, conclusions and recommendations.

At the end of the research paper, Chapter Six includes the Proposal of the Research Team in order to assist the CEMEFA's personnel in the application of the Federal Aviation Regulations Part 145\_Repair Stations. It consist on a manual that does not replace the original texts, it is just a simple compile of the procedures as a guide required to carry out the daily work.

Finally, a Lesson Plan is recommended in order to assist the teaching manual whenever it must be required.



## **INTRODUCTION**

The knowledge of the English language has been emphasized in CEMEFA (Air Force Electronics Maintenance Center), and of the four skills (listening, speaking, reading, and writing), reading has been the mayor skill required for the job. The present research in second language reading focuses on readers' comprehension.

Reading requires understanding, or comprehending, the meaning of print. Readers must develop certain skills that will help them comprehend what they read and use this as an aid to reading. Using reading to learn new information, using reading to communicate with other people or reading for pleasure are the most important reasons.

A research in second language reading suggests that learners use a variety of strategies to assist them with the acquisition, storage, and retrieval of information (Rigney, 1978). Acquiring strategies to understand remember and communicate what is read, or reading comprehension strategies. People need to be taught comprehension strategies, or the steps good readers use to make sure they understand text. The person who is in control of their own reading comprehension becomes purposeful, active readers.

This research does not has the intent to teach CEMEFA's personnel these strategies at all, and less make them fluent readers, but guide these people offering a manual that has been developed in an easy, precise, and concise way as an assistant in the application of the Federal Aviation Regulations Part 145\_Repair Stations.

This Repair Station Manual (RSM) has been developed in accordance with the current Federal Aviation Regulation (FAA), Advisory Circular (AC) 145-9 and the internal

policies and procedures of Electronic Maintenance Center (CEMEFA), however this instrument does not replace the original texts, it is just a simple compile of the procedures as guide required to carry out the daily work.

Our research team hopes this work has a big value not only to help to accomplish the Enterprise's objectives, but also to contribute with the professional growth of each one of its employees.

## **RESEARCH THEME**

**“THE INCIDENCE OF THE PERSONNEL’S ENGLISH READING COMPREHENSION LEVEL ON THE APPLICATION PROCESS OF THE FAR\_145 IN THE ELECTRONICS MAINTENANCE CENTER OF GUAYAQUIL DURING THE MONTHS OF JUNE AND JULY, 2007”**

## **PART ONE**

### **RESEARCH PROBLEM**

#### **1.1. Problem Identification**

The Ecuadorian Air Force Electronics Maintenance Center (CEMEFA) is located in Guayaquil-Ecuador. It's an Electronics Repair Station that provides preventive and corrective maintenance to Communication/Navigation and Instruments devices for private, commercial and military aircrafts. It also sells and/or installs avionics (Communication/Navigation) systems and instruments devices.

The CEMEFA, in order to accomplish its mission, must follow the international rules and procedures with the aim to continue being a competitive enterprise in a global world. These norms are called Federal Aviation Regulations (FAR) and the entity in charge to fulfill and to do fulfill them is the Federal Aviation Administration (FAA).

The Code of Federal Regulations (CFR) is the codification of the general and permanent rules published in the U.S. Federal Register by the executive departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to Federal Regulation. Each volume of the CFR is updated once each calendar year and is issued on a quarterly basis. The 14 title is the related with the Aviation and under this title are the Federal Aviation Regulations (FAR).

The Avionics Technical English is related exclusively with the electronic and instruments area. In this environment there are quantities of terms. But, the present study is leaded to those associated with Federal Aviation Regulations (FAR) Part 145\_Repair Stations.

The FAR Parts 145\_Repair Stations establishes procedures, programs, systems, and methods used to carry out the daily work in a Repair Station. They are thoroughly reviewed, evaluated, and tested by the FAA. Basically, the norms are a set of rules and regulations that must be accomplished in order for a Repair Station becomes and maintains a good product or service.

Among others documents which are used everyday at CEMEFA, it is important to mention the technical manuals like Installation, Maintenance, Operation, Trouble Shutting, etc.; rules manuals like Type Certificates, Supplemental Type Certificates, Airworthiness Directives (ADs), Advisory Circulars (ACs), Service Bulletins, Technical Standard Orders (TSO), Parts Manufacturer Approvals, etc.; and internal procedures manuals like Repair Station Manual, Quality Control Manual, Forms Manual, Training Manual, etc. It is important to emphasize that all the documents are written in English Language.

The knowledge of the English language has been emphasized in CEMEFA, and of the four skills (listening, speaking, reading, and writing), reading has been the mayor skill required for the job. Thus, the level of the reading comprehension proficiency level must be according to the kind of work developed by the personnel specially technicians. But, the avionics technical English language reading proficiency level related to the Federal Aviation Regulations (FAR) of the technician personnel in the Electronics Maintenance Center is limited, as it was shown in a survey applied to the CEMEFA's personnel. Also, it is important to mention that there is an absence of interest and motivation in the personnel for self-education of these regulations.

In spite of CEMEFA has emphasized the reading ability learning through programs, it is evident that there is not a continuous training program in aviation technical English Language due to the insufficient financial resources assigned from the Matrix-Quito for this purpose.

The interest of the center is not to know how well or how fast the personnel can read, the real interest is to know what they understand and what they interpret of the information found in the technical manuals and how they applied it for the job.

The Ecuadorian Aeronautical Authority reviews periodically or improvised the Repair Stations, and due to the lack of experience in technician personnel about Federal Aviation Regulations (FAR), there is a difficulty to pass inspections.

Everybody knows that the core of the business is the client satisfaction, when a client receives a good service, they return and bring more clients, but if it does not happen. There is a loss of actual and potential customers and a loss of competitiveness in the market.

To determine the knowledge of the CEMEFA's personnel about Federal Aviation Regulations (FAR) Part 145\_Repair Stations, the level of knowledge of Avionics Technical English, and the English knowledge level, it has been applied a survey to the 80% of the total of the personnel. The result of the survey shows that the knowledge of the personnel about Federal Aviation Regulations (FAR), Parts 145\_Repair Stations is normal in a 43.8%. The level of knowledge of Avionics Technical English reaches the 37.5%, which is very low if we relate this to the kind of technical work they carry out

every day. The survey also demonstrates that nobody knows completely to manage the norms and rules established by the FAA.

It is evident that there is a problem in the CEMEFA, which is an inappropriate application of the Repair Stations process, determined for the FAR 145. Because of that, this research is focused to identify the incidence of the personnel's English Reading Comprehension level on the application of this process in the Electronics Maintenance Center of Guayaquil during the months of June and July, 2007.

## **1.2. Problem Setting**

This research is going to take place at the Electronic Maintenance Center (CEMEFA), Province of Guayaquil. The question we would like to answer is: "Does the Personnel's English Reading Comprehension Level affects the application of the FAR\_145 process in the Electronics Maintenance Center?"

## **1.3. Variables working out**

Here we distinguish two variables:

### **1.3.1. Independent Variable**

The Personnel's English Reading Comprehension Level.

### **1.3.2. Dependent Variable**

The application of the Federal Aviation Regulation Part 145\_Repair Stations.

#### 1.4. Conceptualization and Operationalization of Matrix Variables.

VARIABLE	CONCEPTUAL DEFINITION	DIMENSIONS	SUB-DIMENSIONS	INDICATORS
<p><b>Reading Comprehension</b></p> <p>INDEPENDENT</p>	<p><b>Reading comprehension</b> can be defined as the level of understanding of a passage or text. For normal reading rates (around 200-220 words per minute) an acceptable level of comprehension is above 75%.<sup>1</sup></p>	<p>PROCESS<sup>2</sup></p> <p>1. Microprocesses</p> <p>2. Integrative Processes.</p>	<p>CHALLENGES FOR L2 READERS</p> <p>1.1 L2 readers may lack knowledge of English grammar and syntax and therefore, may read word by word.</p> <p>1.2 They may encounter too much unfamiliar vocabulary to grasp the overall concept conveyed in the sentence.</p> <p>1.3 They are also challenged when reading idiomatic expressions and unfamiliar grammatical constructions.</p> <p>2.1 L2 readers may have difficulty with more complex and compound sentences.</p> <p>2.2 They may lose the meaning of references within the text, such as with frequent use of pronouns.</p>	<p>INSTRUCTIONAL ACTIVITIES</p> <ul style="list-style-type: none"> <li>▪ Choral reading to build fluency with the ebb and flow of the language and learn phraseology.</li> <li>▪ Marking sentences to identify units of meaning.</li> <li>▪ Cutting and recombining or arranging sentence strips with units of meaning.</li> <li>▪ Explicit teaching of unfamiliar grammatical and syntactic forms and idiomatic expressions</li> <li>▪ “Close reading” of sentences and paragraphs guided by referential questions.</li> <li>▪ Sentence transformation activities to help understand how complex sentences are constructed.</li> </ul>

<sup>1</sup> [http://en.wikipedia.org/wiki/Reading\\_comprehension](http://en.wikipedia.org/wiki/Reading_comprehension)

<sup>2</sup> <http://coe.sdsu.edu/people/jmora/TE930LAR/readingcompr.htm>



		<p>3. Macroprocesses</p> <p>3.1 L2 readers may have difficulty adjusting their reading strategies to match the author’s intent or purpose.</p> <p>3.2 They may not be familiar with a particular story “grammar” or the organizational patterns of informational text.</p> <p>3.3 They may not be familiar with specific genre and the literary devices used in text.</p> <p>Narvaez (2002) identifies cultural schema effects and theme comprehension elements that may impede comprehension for L2 readers:</p>	<p>2.3 Pronoun usage may be different or less frequent in the native language.</p> <p>2.4 Connectives may be overlooked or misunderstood so they lose the relationships between concepts and ideas.</p>	<ul style="list-style-type: none"> <li>▪ Sentence recombination to learn how ideas are linked together in a text.</li> <li>▪ Substitute antecedents and referents with nouns.</li> <li>▪ Diagram or draw relationships in a paragraph using circles and arrows.</li> <li>▪ Outlining and summarizing paragraphs to focus on how the main idea is supported by details.</li> <li>▪ Identifying the function of paragraphs.</li> <li>▪ Answering the “W” questions: who, what, where, when and why?</li> <li>▪ Identifying problem and solution through guided questions.</li> <li>▪ Conduct “grand conversations” about what students read.</li> <li>▪ Teach using “core book units” for going in depth into a piece of literature, making connections to prior knowledge and learning from the content areas.</li> </ul>
		<p>4. Elaborative processes</p> <p>4.1 They may not be familiar with a particular story “grammar” or the organizational patterns of informational text.</p>	<p>4.1 They may not be familiar with a particular story “grammar” or the organizational patterns of informational text.</p>	<ul style="list-style-type: none"> <li>▪ Use graphic organizers, story maps and other visual displays and representations of characters, setting, and plot.</li> </ul>

		<p>5. Metacognitive processes</p>	<p>4.2 Expectations of what is normal may differ and cause breakdowns in coherence</p> <p>4.3 Cause and consequence chains can differ and/or be more emotional, evoking strong reactions in the reader.</p> <p>4.4 Symbols may differ</p> <p>4.5 There may be differences in what to attend to, what to ignore, or what is superfluous.</p> <p>5.1 L2 readers often use strategies that are applicable to the orthographic system, and the grammatical and syntactic patterns of their L1.</p> <p>5.2 These may or may not transfer into English reading and text. L2 readers' greatest challenge is unfamiliar vocabulary.</p> <p>5.3 They benefit from explicit teaching in how to find word meanings when the text provides sufficient context clues.</p> <p>5.4 They also may lack appropriate "repair strategies" to use when meaning is lost or misinterpretations occur.</p>	<ul style="list-style-type: none"> <li>▪ Make cultural knowledge explicit by describing and explaining values, beliefs, traditions and cultural patterns of behavior using multicultural literature.</li> <li>▪ Focus on affective responses to literature from different genre.</li>   <li>▪ Make cross-linguistic transfer explicit. Have students describe and give examples of similarities and contrasts between L1 and English orthography and grammar.</li> <li>▪ Use advance organizers to guide students' purpose, rate, and focus during reading.</li> <li>▪ Model self-monitoring through the use of strategies through "think-aloud" activities, read and retell activities, paraphrasing and summarizing.</li> <li>▪ Activities can include work in pairs and small groups using students' L1 appropriately.</li> </ul>
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			Subpart E—Operating Rules	<p>for certification as a repairman.</p> <p>§ 145.161 Records of management, supervisory, and inspection personnel.</p> <p>§ 145.163 Training requirements.</p> <p>§ 145.165 Hazardous materials training.</p> <p>§ 145.201 Privileges and limitations of certificate.</p> <p>§ 145.203 Work performed at another location.</p> <p>§ 145.205 Maintenance, preventive maintenance, and alterations performed for certificate holders under parts 121, 125, and 135, and for foreign air carriers or foreign persons operating a U.S.-registered aircraft in common carriage under part 129.</p> <p>§ 145.206 Notification of hazardous materials authorizations.</p> <p>§ 145.207 Repair station manual.</p> <p>§ 145.209 Repair station manual contents.</p> <p>§ 145.211 Quality control system.</p> <p>§ 145.213 Inspection of maintenance, preventive maintenance, or alterations.</p> <p>§ 145.215 Capability list.</p> <p>§ 145.217 Contract maintenance.</p> <p>§ 145.219 Recordkeeping.</p> <p>§ 145.221 Service difficulty reports.</p> <p>§ 145.223 FAA inspections.</p>
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## 1.5. Objectives

### ▪ GENERAL OBJECTIVES

1. To analyze the characteristics of the Reading Comprehension Processes in Foreign Language Reading.
2. To measure the knowledge level of the CEMEFA's personnel about FAR Part\_145
3. To determine the level of incidence of reading comprehension level in applying FAR Part\_145.

### ▪ SPECIFIC OBJECTIVES

- a) To determine the level (process) of reading comprehension of CEMEFA's personnel.
- b) To determine which the ideal level of reading comprehension is.
- c) To determine what the instructional activities are to get the ideal level of reading comprehension.
- d) To determine if the language training programs are according with the specific work.
- e) To verify if the equipment, personnel, technical data, and housing and facilities required for the certificate and rating agree with the declared in the manuals.
- f) To verify if the knowledge of FAR Part\_145 is being well applied at work execution.
- g) To determine the comprehension level of what is read in FAR Part\_145, based on the Analysis of Processes and Subprocesses in Second Language Reading (Microprocesses, Integrative Processes, Macroprocesses, Elaborative Processes, Metacognitive Processes).

- h) To determine which the ideal level of comprehension is of what is read in FAR Part\_145, based on the Analysis of Processes and Subprocesses in Second Language Reading.
- i) To determine what the instructional activities are to get the ideal level of comprehension of what is read in FAR Part\_145, based on the Analysis of Processes and Subprocesses in Second Language Reading.

### **1.6. Justification**

The Electronic Maintenance Center (CEMEFA), in order to accomplish its mission and with the aim to be a competitive enterprise, has reached an International Certification with the FAA (Federal Aviation Administration), the Aeronautical Authority of the United States. This means it has the opportunity to serve to a wide market like the American Aeronautics. But at the same time, it implies to accomplish a lot of rules and norms called Federal Aviation Regulations (FAR) issued by this authority.

The Code of Federal Regulations (CFR) is the codification of the general and permanent rules published in the U.S. Federal Register by the executive departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to Federal Regulation. Each volume of the CFR is updated once each calendar year and is issued on a quarterly basis. The 14 title is the related with the Aviation and under this title are the Federal Aviation Regulations (FAR). Inside of it, we find the Part 145\_Repair Station which describes how to obtain and keep a repair station certificate, this part also contains the rules a certificated repair station must follow related to its performance of maintenance, preventive maintenance, or alterations of an aircraft, airframe, aircraft engine, propeller, appliance, or component. It also applies to any

person who holds, or is required to hold, a repair station certificate issued under this part.

On this base, it is so important that all the CEMEFA's personnel knows, applies, and gets engaged with the Federal Aviation Regulations Part 145\_Repair Stations, because it is the main axis to get the mission and vision of the enterprise under standards of quality, and it will help the employees to improve their skills at work each one develops. Having this in mind, the Incidence of the English Reading Comprehension Level is a topic which will allow us to identify a series of factors that may have either direct or indirect influence on the Application Process of the FAR 145\_Repair Stations in the Electronics Maintenance Center.

Moreover this project is important because the CEMEFA's Manager will be able to determine the weaknesses of his technical personnel related to the knowledge of the Federal Aviation Regulations (FAR) Parts 145\_Repair Stations; and he could take decisions using this base to create a system that allows a bigger performance of the work, under the international standards of aviation, which are over the Civil Ecuadorian Regulation, positioning the CEMEFA among the companies with high standards of quality.

On the base of this research, it is possible to develop an assistance instrument that, in accordance with the current Federal Aviation Regulation (FAR), and the internal policies and procedures of CEMEFA helps and improves the daily work. This instrument should comply with FAR 145.211 (Quality Control Manual) and 145.213

(Inspection of maintenance, preventive maintenance, or alterations). Moreover, this tool will be revised whenever CEMEFA needs or as directed by the FAA.

Finally, the knowledge and application of the Federal Aviation Regulations Part 145\_Repair Stations will not only help to the Enterprise objectives, but also it will also contribute to the professional growth of each one of the employees of the Center.



## **PART TWO**

### **THEORETICAL FRAMEWORK**

#### **2.1. Theoretical and Conceptual Focus**

In our country, the government agency in charge of regulating the air commerce, promoting aviation safety, and overseeing the operation of airports, including air traffic control is the Dirección General de Aviación Civil (DGAC), which is submitted to the Federal Aviation Administration (FAA), the agency of the United States Department of Transportation with authority to regulate and oversee all aspects of civil aviation in the U.S.

The limited Personnel's English Reading Comprehension Level related to the Federal Aviation Regulations (FAR) Part\_145 in the Electronics Maintenance Center could be the main origin of different problems like clients' complaints, returned equipment under warranties, loss of actual and potential customers, and loss of competitiveness among the electronic aviation maintenance local market. If this continues in a near future, the center could lose the certification as an Electronic Maintenance Center approved by the Ecuadorian Civil Aeronautical Authority and the U.S. Federal Aviation Administration.

Generally, the most of the texts define Reading as a way of getting information from something that is written, but this is the macro ability of Reading Comprehension which is understanding a text that is read, or the process of "constructing meaning" from a text. The continuous reading of the FAR\_145 Repair Stations is a way of getting information from written procedures and standards, related directly to the aeronautical electronic area. Moreover, reading involves comprehension of the texts written in English for the

application of these standards, it can be a way for CEMEFA's technical personnel to make a self-education of the regulations.

The purpose of reading is to extract meaning from text, this is reading comprehension, understanding a text that is read, or the process of "constructing meaning" from a text. Comprehension is a "construction process" because it involves all of the elements of the reading process working together as a text is read to create a representation of the text in the reader's mind<sup>1</sup>. When we apply it to the kind of work we develop, we will improve our skills through the understanding of the reading in actions, and we will be able to follow, in an easy way, the policies and procedures issued by the Aeronautical Authority, applied in our case.

## **2.2. Structure**

### **CHAPTER I**

#### **1.1. Reading Comprehension**

##### **1.1.1. Microprocesses**

This level of comprehension occurs at the sentence level. It involves "chunking" ideas within sentences into meaningful phrases and units. The reader selects what is important about the sentence to store in short-term memory.

##### **a. Challenges for L2 Readers**

L2 readers may lack knowledge of English grammar and syntax and therefore, may read word by word. They may encounter too much unfamiliar vocabulary to grasp the overall

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<sup>1</sup> [www.nifl.gov/partnershipforreading/adult\\_reading/glossary/glossary.html](http://www.nifl.gov/partnershipforreading/adult_reading/glossary/glossary.html)

concept conveyed in the sentence. They are also challenged when reading idiomatic expressions and unfamiliar grammatical constructions.

### **b. Instructional Activities**

- Choral reading to build fluency with the ebb and flow of the language and learn phraseology.
- Marking sentences to identify units of meaning
- Cutting and recombining or arranging sentence strips with units of meaning.
- Explicit teaching of unfamiliar grammatical and syntactic forms and idiomatic expressions

### **1.1.2. Integrative Processes**

This process involves inferring connections and relationships between clauses and sentences at the multiple-sentence and paragraph levels. It requires the reader to make linkages by noticing pronoun substitutions, synonym substitutions, inferring cause and effect, and recognizing connectives such as also, however, and unless.

#### **a. Challenges for L2 Readers**

L2 readers may have difficulty with more complex and compound sentences. They may lose the meaning of references within the text, such as with frequent use of pronouns. Pronoun usage may be different or less frequent in the native language. Connectives may be overlooked or misunderstood so they lose the relationships between concepts and ideas.

## **b. Instructional Activities**

- “Close reading” of sentences and paragraphs guided by referential questions.
- Sentence transformation activities to help understand how complex sentences are constructed.
- Sentence recombination to learn how ideas are linked together in a text.
- Substitute antecedents and referents with nouns.
- Diagram or draw relationships in a paragraph using circles and arrows.

### **1.1.3. Macroprocesses**

This involves relating to “the big picture” through organization of ideas from the entire text as well as smaller units. It requires use of knowledge of story structure, expository text structures, poetic formulas and genre.

#### **a. Challenges for L2 Readers**

L2 readers may have difficulty adjusting their reading strategies to match the author’s intent or purpose. They may not be familiar with a particular story “grammar” or the organizational patterns of informational text. They may not be familiar with specific genre and the literary devices used in text.

## **b. Instructional Activities**

- Outlining and summarizing paragraphs to focus on how the main idea is supported by details.

- Identifying the function of paragraphs.
- Answering the “W” questions: who, what, where, when and why?
- Identifying problem and solution through guided questions.

#### **1.1.4. Elaborative Processes**

This process involves going beyond literal comprehension to understanding the coherence of text and to make inferences about the author’s message. It requires that readers make personal connections with what they read, using prior knowledge and making predictions. They also identify with characters and connect with their affective responses.

##### **a. Challenges for L2 Readers**

Narvaez (2002) identifies cultural schema effects and theme comprehension elements that may impede comprehension for L2 readers:

- Different conceptual frameworks may be activated that misguide their reading.
- Expectations of what is normal may differ and cause breakdowns in coherence.
- Cause and consequence chains can differ and/or be more emotional, evoking strong reactions in the reader 4) symbols may differ 5) There may be differences in what to attend to, what to ignore, or what is superfluous.

##### **b. Instructional Activities**

- Conduct “grand conversations” about what students read.

- Teach using “core book units” for going in depth into a piece of literature, making connections to prior knowledge and learning from the content areas.
- Use graphic organizers, story maps and other visual displays and representations of characters, setting, and plot.
- Make cultural knowledge explicit by describing and explaining values, beliefs, traditions and cultural patterns of behavior using multicultural literature.
- Focus on affective responses to literature from different genre.

### **1.1.5. Metacognitive Processes**

Readers reflect on and monitor their comprehension and problem-solving strategies to read and write effectively. These include predicting, visualizing, organizing, tapping into prior knowledge, re-reading and self-questioning. For L2 readers, this includes metalinguistic processes, as they utilize their knowledge and skills as bilingual learners. These include recognizing cognates, translation, and paraphrasing in L1.

#### **a. Challenges for L2 Readers**

L2 readers often use strategies that are applicable to the orthographic system, and the grammatical and syntactic patterns of their L1. These may or may not transfer into English reading and text. L2 readers’ greatest challenge is unfamiliar vocabulary. They benefit from explicit teaching in how to find word meanings when the text provides sufficient context clues. They also may lack appropriate “repair strategies” to use when meaning is lost or misinterpretations occur.

#### **b. Instructional Activities**

- Make cross-linguistic transfer explicit. Have students describe and give examples of similarities and contrasts between L1 and English orthography and grammar.
- Use advance organizers to guide students' purpose, rate, and focus during reading.
- Model self-monitoring through the use of strategies through “think-aloud” activities, read and retell activities, paraphrasing and summarizing.
- Activities can include work in pairs and small groups using students' L1 appropriately.<sup>2</sup>

## **CHAPTER II**

### **2.1. Federal Aviation Regulation Part 145\_Repair Stations.**

The Code of Federal Regulations (CFR) is the codification of the general and permanent rules published in the U.S. Federal Register by the executive departments and agencies of the Federal Government. It is divided into 50 titles that represent broad areas subject to Federal Regulation. Each volume of the CFR is updated once each calendar year and is issued on a quarterly basis. The 14 title is the related with the Aviation and under this title are the Federal Aviation Regulations (FAR). Inside of it, we find the Part 145\_Repair Station which describes how to obtain and keep a repair station certificate, this part also contains the rules a certificated repair station must follow related to its performance of maintenance, preventive maintenance, or alterations of an aircraft,

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<sup>2</sup> <http://coe.sdsu.edu/people/jmora/TE930LAR/readingcompr.htm>

airframe, aircraft engine, propeller, appliance, or component. It also applies to any person who holds, or is required to hold, a repair station certificate issued under this part.

These rules are published at the FAA web site:

[http://www.faa.gov/regulations\\_policies/](http://www.faa.gov/regulations_policies/)

The Federal Aviation Regulations are divided in five (5) subparts from A to E:

### **Subpart A—General**

#### **§ 145.1 Applicability.**

This part describes how to obtain a repair station certificate. This part also contains the rules a certificated repair station must follow related to its performance of maintenance, preventive maintenance, or alterations of an aircraft, airframe, aircraft engine, propeller, appliance, or component part to which part 43 applies. It also applies to any person who holds, or is required to hold, a repair station certificate issued under this part.

#### **§ 145.3 Definition of terms.**

(a) Accountable manager means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145.

(b) Article means an aircraft, airframe, aircraft engine, propeller, appliance, or component part.



(c) Directly in charge means having the responsibility for the work of a certificated repair station that performs maintenance, preventive maintenance, alterations, or other functions affecting aircraft airworthiness.

**§ 145.5 Certificate and operations specifications requirements.**

(a) No person may operate as a certificated repair station without, or in violation of, a repair station certificate, ratings, or operations specifications issued under this part.

(b) The certificate and operations specifications issued to a certificated repair station must be available on the premises for inspection by the public and the FAA.

**Subpart B—Certification**

**§ 145.51 Application for certificate.**

(a) An application for a repair station certificate and rating must be made in a format acceptable to the FAA and must include the following:

- (1) A repair station manual acceptable to the FAA as required by §145.207;
- (2) A quality control manual acceptable to the FAA as required by §145.211(c);
- (3) An organizational chart of the repair station and the names and titles of managing and supervisory personnel;

**§ 145.53 Issue of certificate.**

(a) Except as provided in paragraph (b), (c), or (d) of this section, a person who meets the requirements of this part is entitled to a repair station certificate with appropriate ratings prescribing such operations specifications and limitations as are necessary in the interest of safety.

(b) If the person is located in a country with which the United States has a bilateral aviation safety agreement, the FAA may find that the person meets the requirements of this part based on a certification from the civil aviation authority of that country.

**§ 145.55 Duration and renewal of certificate.**

(a) A certificate or rating issued to a repair station located in the United States is effective from the date of issue until the repair station surrenders it or the FAA suspends or revokes it.

(b) A certificate issued to a repair station located outside the United States is effective from the date of issue until the last day of the 12th month after the date of issue.

**§ 145.57 Amendment to or transfer of certificate.**

(a) The holder of a repair station certificate must apply for a change to its certificate in a format acceptable to the Administrator. A change to the certificate must include certification in compliance with §145.53(c) or (d), if not previously submitted. A certificate change is necessary if the certificate holder—

- (1) Changes the location of the repair station, or
- (2) Requests to add or amend a rating.

(b) If the holder of a repair station certificate sells or transfers its assets, the new owner must apply for an amended certificate in accordance with §145.51.

**§ 145.59 Ratings.**

The following ratings are issued under this subpart:

- (a) Airframe ratings.

(1) Class 1: Composite construction of small aircraft.

(2) Class 2: Composite construction of large aircraft.

(b) Powerplant ratings.

(1) Class 1: Reciprocating engines of 400 horsepower or less.

(2) Class 2: Reciprocating engines of more than 400 horsepower.

(c) Propeller ratings.

(1) Class 1: Fixed-pitch and ground-adjustable propellers of wood, metal, or composite construction.

(2) Class 2: Other propellers, by make.

(d) Radio ratings.

(1) Class 1: Communication equipment. Radio transmitting and/or receiving equipment used in an aircraft to send or receive communications in flight, regardless of carrier frequency or type of modulation used.

(2) Class 2: Navigational equipment. A radio system used in an aircraft for en route or approach navigation.

(3) Class 3: Radar equipment. An aircraft electronic system operated on radar or pulsed radio frequency principles.

(e) Instrument ratings.

(1) Class 1: Mechanical. A diaphragm, bourdon tube, aneroid, optical, or mechanically driven centrifugal instrument used on aircraft or to operate aircraft, including tachometers, airspeed indicators, pressure gauges drift sights, magnetic compasses, altimeters, or similar mechanical instruments.

(2) Class 2: Electrical. Self-synchronous and electrical-indicating instruments and systems, including remote indicating instruments, cylinder head temperature gauges, or similar electrical instruments.

(3) Class 3: Gyroscopic. An instrument or system using gyroscopic principles and motivated by air pressure or electrical energy, including automatic pilot control units, turn and bank indicators, directional gyros, and their parts, and flux gate and gyrosyn compasses.

(4) Class 4: Electronic. An instrument whose operation depends on electron tubes, transistors, or similar devices, including capacitance type quantity gauges, system amplifiers, and engine analyzers.

**§ 145.61 Limited ratings.**

(a) The FAA may issue a limited rating to a certificated repair station that maintains or alters only a particular type of airframe, powerplant, propeller, radio, instrument, or accessory, or part thereof, or performs only specialized maintenance requiring equipment and skills not ordinarily performed under other repair station ratings.

(b) The FAA issues limited ratings for—

(1) Airframes of a particular make and model;

(2) Engines of a particular make and model;

(3) Propellers of a particular make and model;

(4) Instruments of a particular make and model;

(5) Radio equipment of a particular make and model;

(c) For a limited rating for specialized services, the operations specifications of the repair station must contain the specification used to perform the specialized service. The specification may be—

(1) A civil or military specification currently used by industry and approved by the FAA, or

(2) A specification developed by the applicant and approved by the FAA.

### **Subpart C—Housing, Facilities, Equipment, Materials, and Data**

#### **§ 145.101 General.**

A certificated repair station must provide housing, facilities, equipment, materials, and data that meet the applicable requirements for the issuance of the certificate and ratings the repair station holds.

#### **§ 145.103 Housing and facilities requirements.**

(a) Each certificated repair station must provide—

(1) Housing for the facilities, equipment, materials, and personnel consistent with its ratings.

(2) Facilities for properly performing the maintenance, preventive maintenance, or alterations of articles or the specialized services for which it is rated. Facilities must include the following:

(i) Sufficient work space and areas for the proper segregation and protection of articles;

(ii) Segregated work areas enabling environmentally hazardous or sensitive operations;

(b) A certificated repair station with an airframe rating must provide suitable permanent housing to enclose the largest type and model of aircraft listed on its operations specifications.

**§ 145.105 Change of location, housing, or facilities.**

(a) A certificated repair station may not change the location of its housing without written approval from the FAA.

(b) A certificated repair station may not make any changes to its housing or facilities required by §145.103 that could have a significant effect on its ability to perform the maintenance, preventive maintenance, or alterations.

(c) The FAA may prescribe the conditions, including any limitations, under which a certificated repair station must operate while it is changing its location, housing, or facilities.

**§ 145.107 Satellite repair stations.**

(a) A certificated repair station under the managerial control of another certificated repair station may operate as a satellite repair station with its own certificate issued by the FAA. A satellite repair station—

(1) May not hold a rating not held by the certificated repair station with managerial control;

(2) Must meet the requirements for each rating it holds;

(3) Must submit a repair station manual acceptable to the FAA as required by §145.207.

**§ 145.109 Equipment, materials, and data requirements.**

(a) Except as otherwise prescribed by the FAA, a certificated repair station must have the equipment, tools, and materials necessary to perform the maintenance, preventive maintenance, or alterations.

(b) A certificated repair station must ensure all test and inspection equipment and tools used to make airworthiness determinations on articles are calibrated.

**Subpart D—Personnel**

**§ 145.151 Personnel requirements.**

Each certificated repair station must—

(a) Designate a repair station employee as the accountable manager;

(b) Provide qualified personnel to plan, supervise, perform, and approve for return to service the maintenance, preventive maintenance, or alterations;

**§ 145.153 Supervisory personnel requirements.**

(a) A certificated repair station must ensure it has a sufficient number of supervisors to direct the work performed under the repair station certificate and operations specifications.

(b) Each supervisor must—

(1) If employed by a repair station located inside the United States, be certificated under part 65.

(2) If employed by a repair station located outside the United States—

(i) Have a minimum of 18 months of practical experience in the work being performed;

or

**§ 145.155 Inspection personnel requirements.**

(a) A certificated repair station must ensure that persons performing inspections under the repair station certificate and operations specifications.

(b) A certificated repair station must ensure its inspectors understand, read, and write English.

**§ 145.157 Personnel authorized to approve an article for return to service.**

(a) A certificated repair station located inside the United States must ensure each person authorized to approve an article for return to service is certificated under part 65.

(b) A certificated repair station located outside the United States must ensure each person authorized to approve an article is—

(1) Trained in or has 18 months practical experience with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations; and

(c) A certificated repair station must ensure each person authorized to approve an article for return to service understands, reads, and writes English.

**§ 145.159 Recommendation of a person for certification as a repairman.**

A certificated repair station that chooses to use repairmen to meet the applicable personnel requirements of this part must certify in a format acceptable to the FAA that each person recommended for certification as a repairman—

(a) Is employed by the repair station, and

(b) Meets the eligibility requirements of §65.101.



**§ 145.161 Records of management, supervisory, and inspection personnel.**

(a) A certificated repair station must maintain and make available in a format acceptable to the FAA the following:

(1) A roster of management and supervisory personnel that includes the names of the repair station officials and the names of its supervisors.

**§ 145.163 Training requirements.**

(a) A certificated repair station must have an employee training program approved by the FAA that consists of initial and recurrent training. For purposes of meeting the requirements of this paragraph, beginning April 6, 2006—

(1) An applicant for a repair station certificate must submit a training program for approval by the FAA as required by §145.51(a)(7).

(2) A repair station certificated before that date must submit its training program to the FAA for approval by the last day of the month in which its repair station certificate was issued.

**§ 145.165 Hazardous materials training.**

(a) Each repair station that meets the definition of a hazmat employer under 49 CFR 171.8 must have a hazardous materials training program.

**Subpart E—Operating Rules**

**§ 145.201 Privileges and limitations of certificate.**

(a) A certificated repair station may—

(1) Perform maintenance, preventive maintenance, or alterations in accordance with part 43 on any article for which it is rated and within the limitations in its operations specifications.

(2) Arrange for another person to perform the maintenance, preventive maintenance, or alterations of any article for which the certificated repair station is rated.

(b) A certificated repair station may not maintain or alter any article for which it is not rated.

(c) A certificated repair station may not approve for return to service—

(1) Any article unless the maintenance, preventive maintenance, or alteration was performed in accordance with the applicable approved technical data or data acceptable to the FAA.

#### **§ 145.203 Work performed at another location.**

A certificated repair station may temporarily transport material, equipment, and personnel needed to perform maintenance, preventive maintenance, alterations, or certain specialized services for which it is rated to a place other than the repair station's fixed location if the following requirements are met:

(a) The work is necessary due to a special circumstance, as determined by the FAA; or

(b) It is necessary to perform such work on a recurring basis, and the repair station's manual includes the procedures for accomplishing maintenance at a place other than the repair station's fixed location.

#### **§ 145.205 Maintenance, preventive maintenance, and alterations performed for certificate holders under parts 121, 125, and 135, and for foreign air carriers or**

**foreign persons operating a U.S.-registered aircraft in common carriage under part 129.**

(a) A certificated repair station that performs maintenance, preventive maintenance, or alterations for an air carrier or commercial operator that has a continuous airworthiness maintenance program under part 121 or part 135 must follow the air carrier's or commercial operator's program and applicable sections of its maintenance manual.

(b) A certificated repair station that performs inspections for a certificate holder conducting operations under part 125 must follow the operator's FAA-approved inspection program.

(c) A certificated repair station that performs maintenance, preventive maintenance, or alterations for a foreign air carrier or foreign person operating a U.S.-registered aircraft under part 129 must follow the operator's FAA-approved maintenance program.

**§ 145.206 Notification of hazardous materials authorizations.**

(a) Each repair station must acknowledge receipt of the part 121 or part 135 operator notification required under §§121.1005(e) and 135.505(e) of this chapter prior to performing work for, or on behalf of that certificate holder.

**§ 145.207 Repair station manual.**

(a) A certificated repair station must prepare and follow a repair station manual acceptable to the FAA.

(b) A certificated repair station must maintain a current repair station manual.

(c) A certificated repair station's current repair station manual must be accessible for use by repair station personnel required by subpart D of this part.

**§ 145.209 Repair station manual contents.**

A certificated repair station's manual must include the following:

- (a) An organizational chart identifying—
  - (1) Each management position with authority to act on behalf of the repair station,
  - (2) The area of responsibility assigned to each management position, and
  - (3) The duties, responsibilities, and authority of each management position;
- (b) Procedures for maintaining and revising the rosters required by §145.161;
- (c) A description of the certificated repair station's operations, including the housing, facilities, equipment, and materials as required by subpart C of this part;

**§ 145.211 Quality control system.**

- (a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station.
- (b) Repair station personnel must follow the quality control system when performing maintenance under the repair station certificate and operations specifications.
- (c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following:
  - (1) A description of the system and procedures used for—
    - (i) Inspecting incoming raw materials to ensure acceptable quality;
    - (ii) Performing preliminary inspection of all articles that are maintained;

**§ 145.213 Inspection of maintenance, preventive maintenance, or alterations.**

(a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance.

(b) A certificated repair station must certify on an article's maintenance release that the article is airworthy with respect to the maintenance, preventive maintenance, or alterations performed after—

(1) The repair station performs work on the article; and

(2) An inspector inspects the article on which the repair station has performed work and determines it to be airworthy with respect to the work performed.

**§ 145.215 Capability list.**

(a) A certificated repair station with a limited rating may perform maintenance, preventive maintenance, or alterations on an article if the article is listed on a current capability list acceptable to the FAA or on the repair station's operations specifications.

(b) The capability list must identify each article by make and model or other nomenclature designated by the article's manufacturer and be available.

**§ 145.217 Contract maintenance.**

(a) A certificated repair station may contract a maintenance function pertaining to an article to an outside source provided—

(1) The FAA approves the maintenance function to be contracted to the outside source; and

(2) The repair station maintains and makes available to its certificate holding district office, in a format acceptable to the FAA, the following information:

(i) The maintenance functions contracted to each outside facility; and

(ii) The name of each outside facility to whom the repair station contracts maintenance functions and the type of certificate and ratings, if any, held by each facility.

(b) A certificated repair station may contract a maintenance function pertaining to an article to a noncertificated person provided—

(1) The noncertificated person follows a quality control system equivalent to the system followed by the certificated repair station;

(2) The certificated repair station remains directly in charge of the work performed by the noncertificated person; and

**§ 145.219 Recordkeeping.**

(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.

(b) A certificated repair station must provide a copy of the maintenance release to the owner or operator of the article on which the maintenance, preventive maintenance, or alteration was performed.

(c) A certificated repair station must retain the records required by this section for at least 2 years from the date the article was approved for return to service.

**§ 145.221 Service difficulty reports.**

(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.

(b) The report required under paragraph (a) of this section must include as much of the following information as is available:

- (1) Aircraft registration number;
- (2) Type, make, and model of the article;

**§ 145.223 FAA inspections.**

(a) A certificated repair station must allow the FAA to inspect that repair station at any time to determine compliance with this chapter.

(b) A certificated repair station may not contract for the performance of a maintenance function on an article with a noncertificated person unless it provides in its contract with the noncertificated person that the FAA.

(c) A certificated repair station may not return to service any article on which a maintenance function was performed by a noncertificated person if the noncertificated person does not permit the FAA to make the inspection described in paragraph (b) of this section.

## **CHAPTER III**

### **3.1. Metacognition and Reading to Learn**

Metacognition has been defined as "having knowledge (cognition) and having understanding, control over and appropriate use of that knowledge"(Tei & Stewart, 1985). Thus, it involves both the conscious awareness and the conscious control of one's learning.

A research on metacognition presents reading to learn from a metacognitive perspective as it relates to four variables:

- **Text**. The first variable refers to the textual features of learning materials which influence comprehension and memory. Factors such as arrangement of ideas in texts, vocabulary, syntax, clarity of author's intentions, and reader's interest and familiarity with a text all have an effect on students' learning.

Knowledge of text structure is critical for reading to learn; it is requisite for efficient use of study time. By detecting the organizational patterns or structures of texts, students can observe how authors arrange ideas and determine which kinds of structures are used to interrelate ideas.

- **Task**. Another variable of metacognition in reading to learn pertains to the task that the reader is required to perform. For example, locating a specific detail in a text requires a different process than that needed to write a critical analysis of the text. As with other facets of metacognition, mature and immature learners differ with respect to their knowledge of, and ability to control, task variables.

Fundamental to any task in reading is the derivation of meaning from the text. In order for learning to occur, readers must be aware that the purpose of reading is to construct meaning. The reader must learn how to adapt reading behavior to specific tasks.

A related index of metacognitive development with regard to the task is the reader's ability to accurately predict his or her performance on the task. For young readers, this may be quite difficult, but with age and reading experience, readers begin to pick up cues which give them information about how well they have performed



- **Strategies.** The reader needs knowledge about metacognition strategies. An additional category of metacognitive knowledge and control involves knowing how to remedy comprehension failures. It is not enough to be aware of one's understanding or failure to understand--a learner must be able to self-regulate his or her reading process in order to read for comprehension. Research indicates that readers use many strategies, but that a distinction exists between good readers and poor readers.

Study strategies are important in reading to learn and can be applied to enhance text processing. Common studying strategies include underlining, outlining, note taking, summarizing, and self-questioning. Many of these strategies are complex and best handled by older and more experienced readers.

- **Learner characteristics.** A final category of metacognition in reading to learn is the awareness of the learner of his or her own characteristics--such as background knowledge, degree of interest, skills, and deficiencies--and of how these affect learning. Again, the reader must be able to take that awareness and translate it into a change in reading behaviour. Research suggests that successful students tend to relate information in texts to previous knowledge; less successful students showed little tendency to use their knowledge to clarify the text at hand.

Thus, learner characteristics, like texts, tasks, and strategies, are age and experience dependent. The development of metacognition appears to be linked to proficiency in learning. A related conclusion about metacognitive development is that knowledge precedes control. The researchers suggest that learners must first become aware of structures of text, as well as knowledge of the task and their own characteristics as

learners, before they can strategically control the learning process to optimize the influence of these factors.

### **3.2. Gaining Knowledge by Reading**

One of the most important ways that modern humans can gain knowledge is by reading. We can witness the experiences and thoughts that people have documented throughout the ages. Questions we may include are: what should I read, where can I get reading material, and what are some problems concerning reading.

Reading can include the newspapers, magazines, work- or school-related books, fiction, and books on subjects of interest. Reading fiction cannot only get you involved in the story, but is also a source of useful facts and representations of how people act and think.

Books and magazine articles can teach, as well as give opinions of the authors. Readers should not only read about things you are interested, but also be curious enough to look into new material and different subjects. To get material, we can get books from the library or bookstore. We can access articles, essays and lessons over the Internet.

Problems concerning reading are separating the wheat from the chafe. Among the useful information, there is a large quantity of useless or even incorrect information. Even within a useful text, there may be extraneous information on which you just don't need to spend the time. Speed-reading and skim reading are useful skills to help decide what you should bother with. In conclusion Reading is an important way to gain knowledge.

### **3.3. Reading to Learn Text**

#### **a. What is a text?**

A text is a body of language; it could consist of a single word like 'Ladies' or 'Gentlemen' on a toilet door right up to a complete book and can be either written or spoken.<sup>3</sup>

#### **b. Defining FAR as text**

Much of the material workers have to learn at the CEMEFA is presented in written form, most commonly in FAR texts and regulations from FAA thus, FAR can be categorized as a textbook that is a manual of instruction or a standard book for applying of Aeronautical development.

#### **c. Reading and understanding texts**

Reading is actually a very complex process that requires a great deal of active participation on the part of the reader. In many cases, workers may have problems with both the complexity and the amount of the written material they have to read.

Reading is asking questions of printed text. And reading with comprehension becomes a matter of getting your questions answered. - Frank Smith in *Reading Without Nonsense* (1997). Literacy practices are almost always fully integrated with, interwoven into, constituted as part of, the very texture of wider practices that involve talk, interaction, values, and beliefs. - James Gee in *Social Linguistics and Literacies* (1996).

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<sup>3</sup> <http://www.usingenglish.com/glossary/text.html>

Proficient readers know when unknown words will interfere with achieving their purpose for reading, and when they won't. When unknown words arise and their meaning is needed for comprehension, proficient readers have a number of word attack strategies available to them that will allow them to decipher the meaning of the words to the extent that they are needed to achieve the purpose for reading.

Reading is also a complex process in that proficient readers give to the text as much as they take. They make meaning from the text by using their own prior knowledge and experiences. Proficient readers are constantly making predictions while reading. They are continuously anticipating what will come next. Their prior knowledge and experiences with texts as well as with the world around them allow them to do this. It is this continuous interaction with the text that allows readers to make sense of what they are reading. As we can see, reading involves many complex skills that have to come together in order for the reader to be successful.

We can help us deal with each of these concerns taking into account some specific tips used in reading comprehension<sup>4</sup>:

- Build active learning activities into each reading session, since reading is an inherently passive process. Merely exposing yourself to material is not an effective learning activity, even if you do it many times.
- Get the big picture first, so the details will have a structure and categories to fit into.

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<sup>4</sup> <http://www.coun.uvic.ca/learning/reading-skills/>

- Find out what you don't remember (by reviewing from memory) to focus future learning.

### **3.4. Defining comprehension**

In general usage, and more specifically in reference to education and psychology, Comprehension has roughly the same meaning as understanding<sup>5</sup>.

#### **a. FAR texts comprehension**

The undisputed purpose of learning by reading is to comprehend. Although they are limited in what they read independently, comprehension instruction can occur as soon as they enter any English language school.

Comprehension depends, firstly, on a large, working vocabulary and substantial background knowledge on the theme. Further, comprehension is enhanced when self-testing make sure workers understand what they are reading by answering written questions and encouraging them question and discussion.

An effective instruction will help the reader actively relate his or her own knowledge or experience to the ideas written in the text, and then remember the ideas that he or she has come to understand. Every opportunity should be taken by readers to extend and enrich their background knowledge and understanding in every way possible, for the ultimate significance and memorability of any word or text depends on whether they

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<sup>5</sup> [http://en.wikipedia.org/wiki/Reading\\_comprehension](http://en.wikipedia.org/wiki/Reading_comprehension)

possess the background knowledge and conceptual sophistication to understand its meaning.

Engaging workers in text comprehension may occur before, during, and after reading a FAR text. From work applicators onward, but specific comprehension abilities must be required explicitly.

Many techniques are shown to enhance text comprehension. Although these strategies can sometimes be effective if taught alone, they are generally more effective if taught in clusters and used with flexibility. Teachers can explicitly model ways to raise questions, think about the text, and deepen comprehension as reading proceeds. However, these modeling skills require educators to practice, learn from coaching, and observe mentor teachers.

Previewing, especially for expository FAR texts, should help workers become aware of what they already know about the topic and what they would like to know. During reading, they should learn to monitor whether they understand and to apply strategies such as rereading to "fix up" comprehension problems. They also should be able to ask themselves clarifying questions about the assessed regulations.

After reading, they need to summarize what they have learned and extend their comprehension beyond the text itself. Connecting new information to known information, evaluating the Federal Aviation intent, retelling or summarizing, or constructing a graphic representation of the information may be appropriate at different times. Again, a combination of techniques is likely to be most effective.

Teaching comprehension is complex, and prior researches suggest that it is seldom taught well. Teachers often spend too much time on literal questions that test literal comprehension, in place of queries that encourage deeper engagement of the text with higher levels of thinking.

**b. Difficulties with FAR comprehension.**

In CEMEFA's work environment, technicians benefit from almost daily opportunities to read FAR texts, transcribe, organize and edit their thoughts in writing. A variety of assignments appropriate to their abilities is desirable. But, CEMEFA's workers need strong vocabularies, rich background knowledge, and well-developed comprehension strategies to become successful comprehenders of FAR texts.

While they are building the skills of letter formation, spelling, and sentence generation, people also should be taught to compose in stages: generating and organizing ideas, initially with a group or partner; producing a draft; sharing ideas with others for the purpose of gaining feedback; and revising, editing, and proofreading.

**c. Motivation counts in comprehension FAR text.**

Varying motivations to read can influence worker's effort and strategy use in making meaning from a FAR text.

Reading comprehension is not a simple and automatic skill, it is an active and strategic process of cognition (or thought). The development of comprehension abilities and cognitive processes is the primary aim of much reading instruction, and enabling people

to understand and to criticize new texts on new themes is a fundamental goal of many reading curricula.

Teachers and researchers who believe in the primacy of comprehension, however, often make two vital assumptions:

- They suppose that a person, who is able to comprehend, will choose to comprehend, and they assume that the comprehending person will select books, read at appropriate times, persist through difficult material, and gain satisfaction from reading. But, John T. Guthrie, Lois Bennett, and Karen Mc. Gough (1994) suggest that these assumptions may not always be true.
- Some people who can comprehend will choose to read, but many will not. Most people do not read very much, including many of those who can read very well.

The same phenomena occurs at CEMEFA, where workers' comprehension skills are not the best, moreover it does not exist a program to relieve it.

Researchers view reading comprehension as a potential for reading activity. Acts of choosing books, finding materials, and persisting are releasing agents. They release the potential of comprehension for the people's benefit. A person who comprehends well without reading frequently possesses a potential that is unrealized.

Although active reading depends partly on comprehension abilities, it depends more on motivations for reading. An environment that supports the development of active reading creates contexts that satisfy the people's needs for curiosity, aesthetic



involvement, challenge, competitiveness, and social exchange. The most central of these is curiosity, the desire to know more about something.

All the people have interests and preferences, and affording people opportunities to read according to their preferences is motivating.

**d. Comprehension skills required for FAR text comprehension.**

Reading requires understanding, or comprehending, the meaning of print. At CEMEFA, workers must develop certain skills that will help them comprehend what they read in FAR texts and use this as an aid to reading. Comprehensibility in writing is related to comprehension in reading.

Comprehension skills are the ability to use context and prior knowledge to aid reading and to make sense of what one reads and hears.

Comprehension is based on:

- Knowledge that reading makes sense
- Readers' prior knowledge
- Information presented in the text, and the use of context to assist recognition of words and meaning.

## **2.3. Hypothesis System**

### **2.3.1. Alternative Hypothesis**

The personnel's English reading comprehension level affect positively on the application process of the FAR 145\_Repair Stations.

### **2.3.2. Null Hypothesis**

The personnel's English reading comprehension level does not affect positively on the application process of the FAR 145\_Repair Stations.

## **PART THREE**

### **METHODOLOGICAL DESIGN**

#### **3.1. Research Type and Design**

The research type to be used, according to the purpose, is a Basic one, which has as its primary objective the improvement of knowledge and the theoretical understanding of the relations among the variables. The Basic Research is driven by an interest in a scientific question. The main motivation is to expand man's knowledge, not to create or invent something. According to the level of knowledge that it wants to achieve, the Descriptive Research will be use, which provides data about the population or universe being studied. But, it can only describes the "who, what, when, where and how" of a situation, not what caused it. Finally, by the means to be used, the Field Research will help to the researchers go "into the field" to observe the phenomenon in its natural state or in situ.

The steps to follow in this research are as follows,

1. Determine the research problem and hypotheses to be tested.
2. Select the variables to be used in the study.
3. Collect the data.
4. Analyze the data.
5. Interpret the results.

### **3.2. Population and Sample**

The population is the entire group of individuals that we want information about, and the sample is the part of the population that we actually examine in order to gather information.

A large population may be impractical and costly to study, collecting data from every member of the population. A sample is more manageable and easier to study.

After collecting and organizing the data, a summary is made such as average values. Hopefully valid conclusions can be made on the whole population based on the sample data. Therefore it is important that the sample data collected be representative of the population. Otherwise conclusions may be invalid. Conclusions are only as reliable as the sampling process, and information can change from sample to sample.

Determining the sample size for the present research implies to identify how many members of the population should be selected to ensure that is properly represented. In this case, because of the population is very small, there is not sample, that means 21 people.

### **3.3. Field Work**

The field work will take place in the Ecuadorian Air Force Electronics Maintenance Center (CEMEFA) that is located in Guayaquil-Ecuador, during the months of June and July, 2007.

### **3.4. Instruments for the Collection**

The TEST will be the technique applied for gathering data (Annex 1. Test about FAR 145—Repair Stations and Annex 2. Reading Comprehension Test).

The Proficiency test is the one we will use to measure people's ability in English language regardless of any training they may have had in this language. The content of a proficiency test, therefore, is not based on the content or objectives of language courses that people taking the test may have followed. Rather, it is based on a specification of what candidates have to be able to do in the language in order to be considered proficient. This raises the question of what we mean by the word 'proficient'.

In the case of some proficiency tests, 'proficient' means having sufficient command of the language for a particular purpose. In this case it would be a test designed to discover the reading proficiency.

The Diagnostic test is the one we will use to identify workers' strengths and weaknesses about the knowledge of FAR. They are intended primarily to ascertain what learning still needs to take place.

### **3.5. Processing and Analysis.**

For the data analysis we will use the descriptive statistics measures of central tendency and dispersion to compare the results.

**PART FOUR**

**TESTING THE HYPOTHESIS**

**4.1. Graphical exposition of results**

Once the CEMEFA’s personnel had taken the Reading Comprehension and FAR 145 Test, the results are the following:

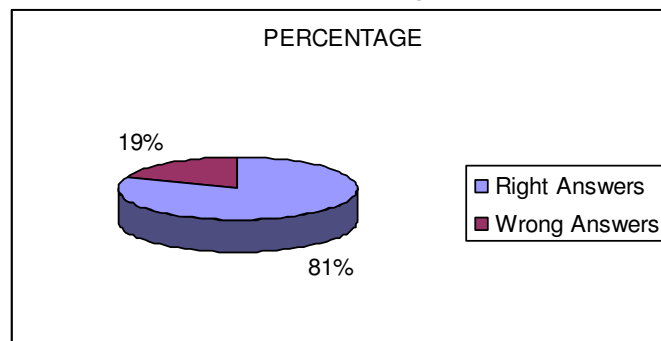
**4.1.1. FAR 145 Test Results**

**a. Results exposition by question**

**TABLE 1. Q1. Who is the responsible for all Repair Station operations that are conducted under part 145?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	17	81,0	81,0	81,0
	Wrong Answers	4	19,0	19,0	100,0
	Total	21	100,0	100,0	

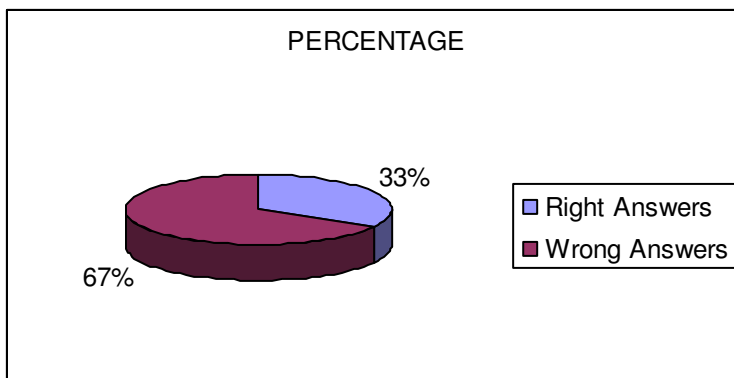
**GRAPHIC No. 01 Percentage Question 1**



**TABLE 2. Q2. Which of the following statements is/are directly regarding with the definition of Line Maintenance?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	7	33,3	33,3	33,3
	Wrong Answers	14	66,7	66,7	100,0
	Total	21	100,0	100,0	

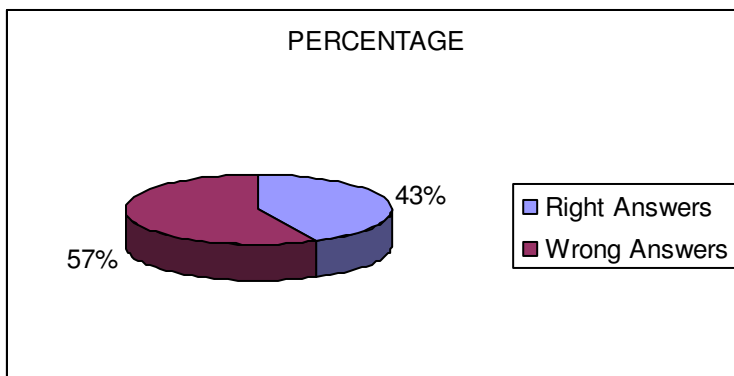
**GRAPHIC No. 02 Percentage Question 2**



**TABLE 3. Q3. Which condition is necessary regarding the certificate and operations specifications issued to a certificated repair station?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	9	42,9	42,9	42,9
	Wrong Answers	12	57,1	57,1	100,0
Total		21	100,0	100,0	

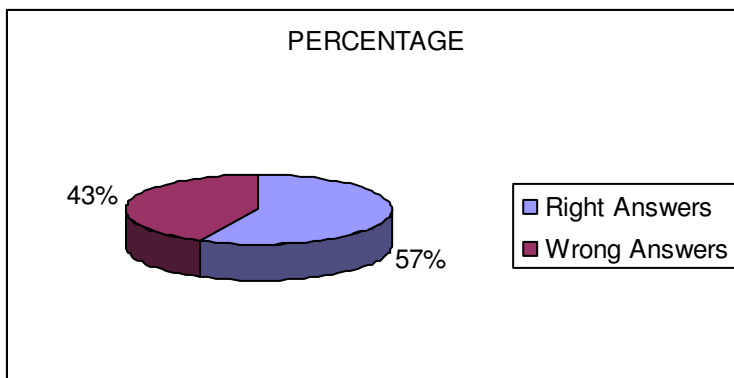
**GRAPHIC No. 03 Percentage Question 3**



**TABLE 4. Q4. An application for a repair station certificate and rating must be made in a format acceptable to the FAA and must include the following:**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	12	57,1	57,1	57,1
	Wrong Answers	9	42,9	42,9	100,0
Total		21	100,0	100,0	

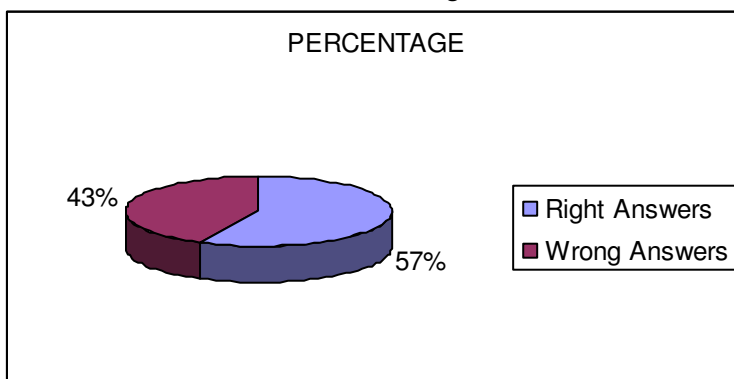
**GRAPHIC No. 04 Percentage Question 4**



**TABLE 5. Q5. Which statement is true regarding to the certificate issued to a repair station located outside the United States?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	12	57,1	57,1	57,1
Wrong Answers	9	42,9	42,9	100,0
Total	21	100,0	100,0	

**GRAPHIC No. 05 Percentage Question 5**

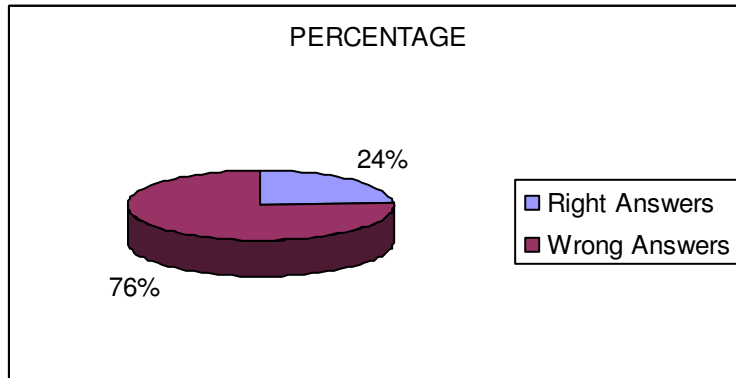


**TABLE 6. Q6. What task must be completed before a repair station certificate can be issued for a repair station that is located outside the United States?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	5	23,8	23,8	23,8
Wrong Answers	16	76,2	76,2	100,0
Total	21	100,0	100,0	



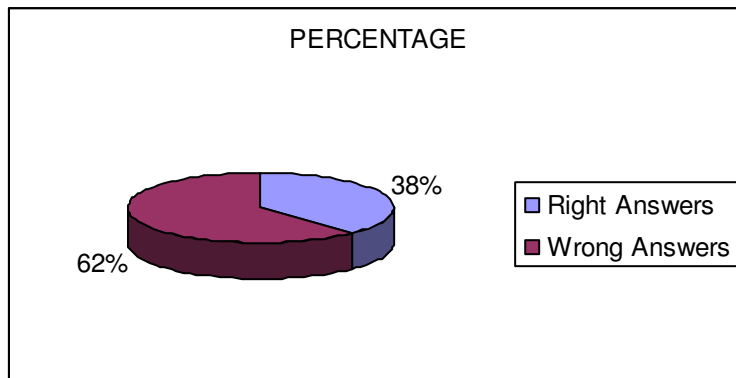
**GRAPHIC No. 06 Percentage Question 6**



**TABLE 7. Q7. Inside the requirements to obtain a FAA certificate, you must demonstrate:**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	8	38,1	38,1	38,1
Wrong Answers	13	61,9	61,9	100,0
Total	21	100,0	100,0	

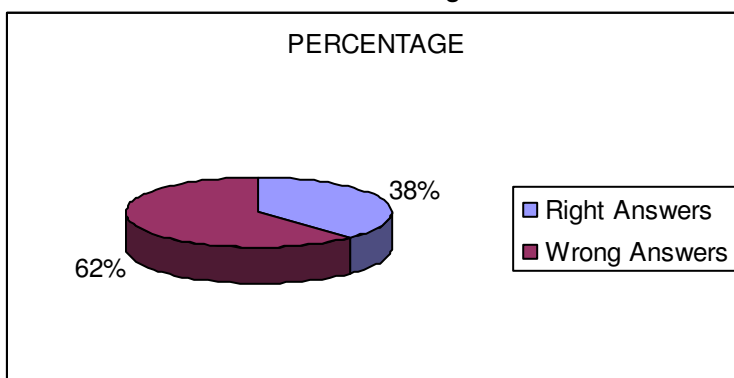
**GRAPHIC No. 07 Percentage Question 7**



**TABLE 8. Q8. The holder of an expired, surrendered, suspended, or revoked certificate must:**

	Frequency	Percent
Missing Right Answers	13	61,9
Wrong Answers	8	38,1
Total	21	100,0

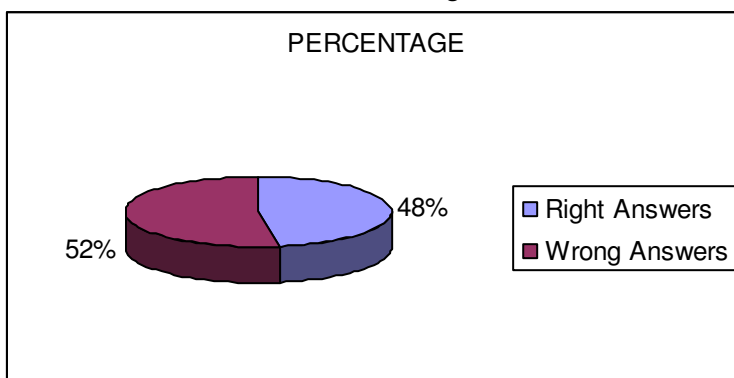
**GRAPHIC No. 08 Percentage Question 8**



**TABLE 9. Q9. The Part 145.59 (d) refers to radio ratings. Inside of it we find different classes, what Class 2 refers to?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	10	47,6	47,6	47,6
Wrong Answers	11	52,4	52,4	100,0
Total	21	100,0	100,0	

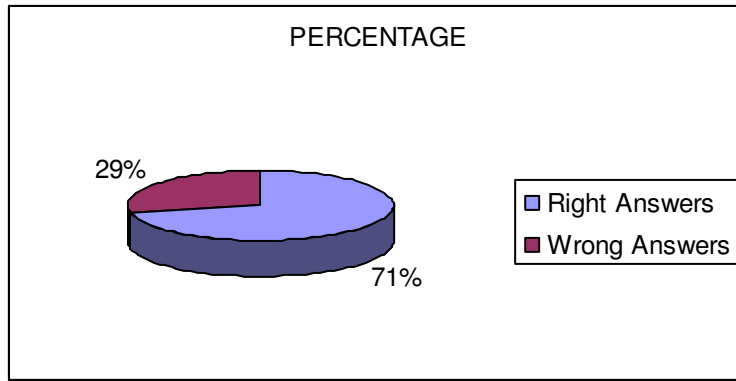
**GRAPHIC No. 09 Percentage Question 9**



**TABLE 10. Q10. The Part 145.59 (e) refers to instrument ratings. Inside of it we find different classes, what Class 2 refers to?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	15	71,4	71,4	71,4
Wrong Answers	6	28,6	28,6	100,0
Total	21	100,0	100,0	

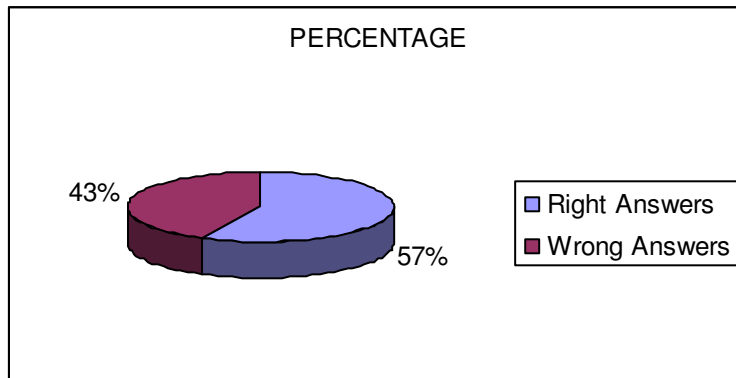
**GRAPHIC No. 10 Percentage Question 10**



**TABLE 11. Q11. A certified repair station must ensure its supervisors, inspectors and each person authorized to approve an article for return to service...**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	12	57,1	57,1	57,1
Wrong Answers	9	42,9	42,9	100,0
Total	21	100,0	100,0	

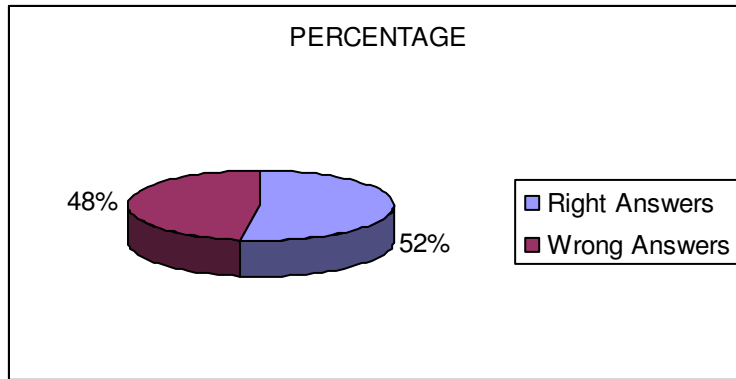
**GRAPHIC No. 11 Percentage Question 11**



**TABLE 12. Q12. The part 145.161 (a) explains that a certified repair station must maintain and make available a roster of all the personnel with the names and responsibilities. If this roster changes, how long must it reflect these changes?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	11	52,4	52,4	52,4
Wrong Answers	10	47,6	47,6	100,0
Total	21	100,0	100,0	

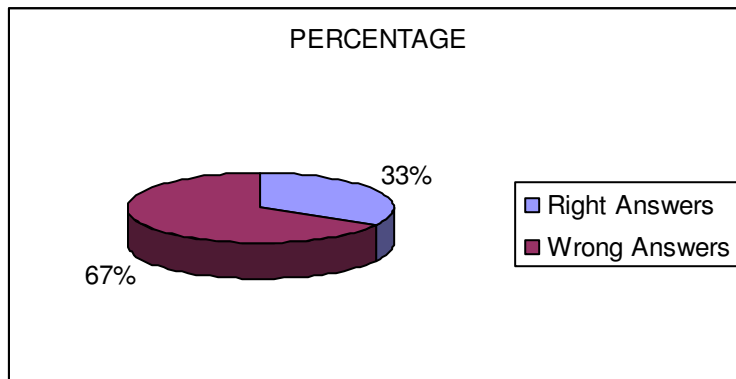
**GRAPHIC No. 12 Percentage Question 12**



**TABLE 13. Q13. The roster of the repair station must be composed of:**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	7	33,3	33,3	33,3
	Wrong Answers	14	66,7	66,7	100,0
	Total	21	100,0	100,0	

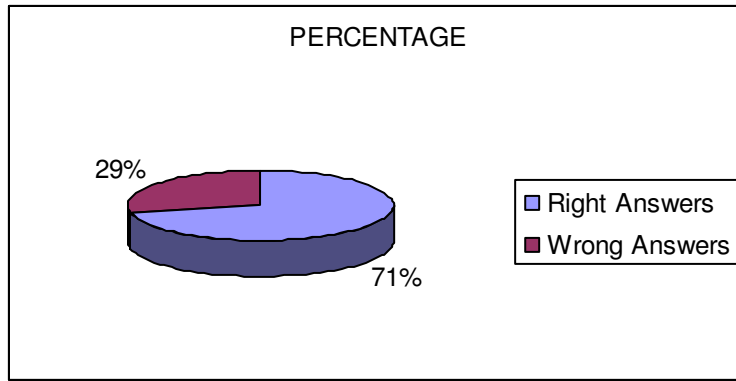
**GRAPHIC No. 13 Percentage Question 13**



**TABLE 14. Q14. A certified repair station located outside the United States must ensure that the personnel authorized to approve an article for return to service:**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	15	71,4	71,4	71,4
	Wrong Answers	6	28,6	28,6	100,0
	Total	21	100,0	100,0	

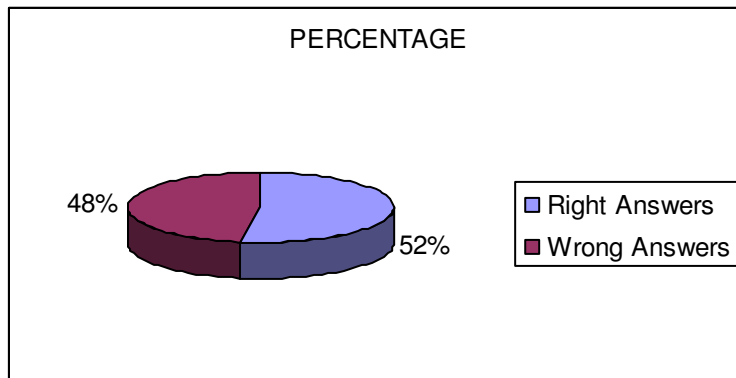
**GRAPHIC No. 14 Percentage Question 14**



**TABLE 15. Q15. A certified repair station must retain the records of the articles that were approved for return to service**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	11	52,4	52,4	52,4
	Wrong Answers	10	47,6	47,6	100,0
Total		21	100,0	100,0	

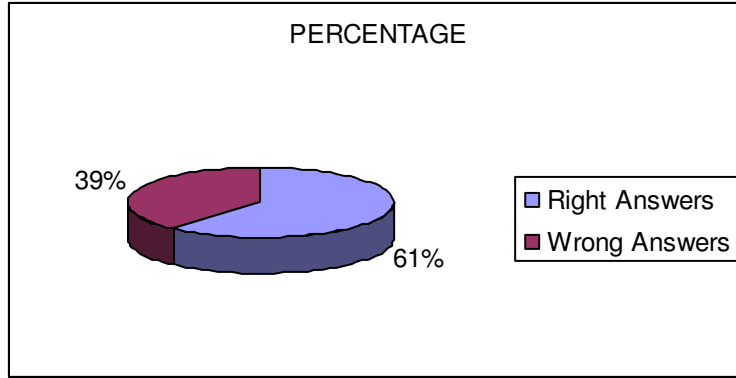
**GRAPHIC No. 15 Percentage Question 15**



**TABLE 16. Q16. What must a training program ensure?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	9	42,9	42,9	42,9
	Wrong Answers	12	57,1	57,1	100,0
Total		21	100,0	100,0	

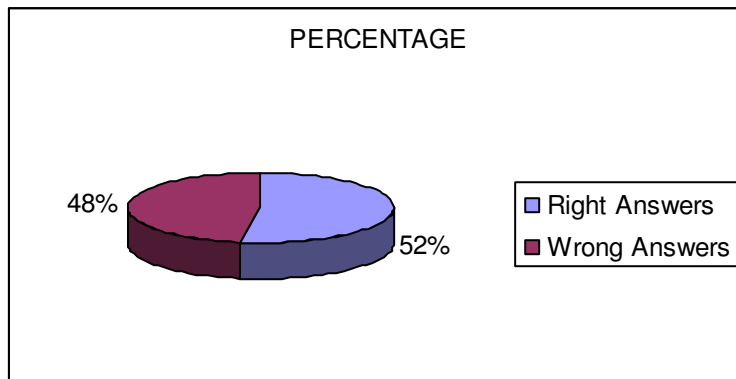
**GRAPHIC No. 16 Percentage Question 16**



**TABLE 17. Q17. The training records must be retained for:**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	11	52,4	52,4	52,4
	Wrong Answers	10	47,6	47,6	100,0
	Total	21	100,0	100,0	

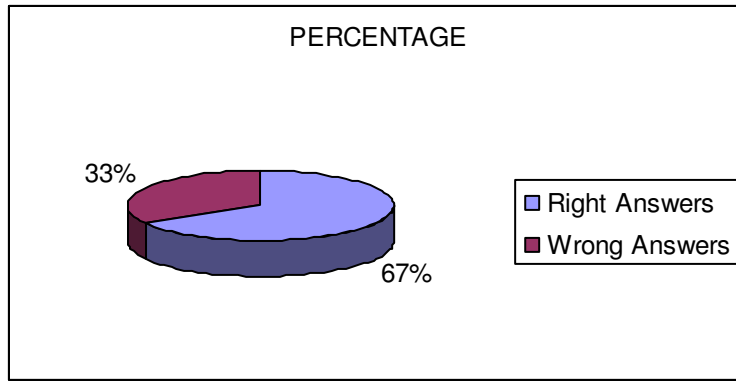
**GRAPHIC No. 17 Percentage Question 17**



**TABLE 18. Q18. May a certificated repair station arrange for another person to perform the maintenance of any article for which the certificated repair station is rated?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	14	66,7	66,7	66,7
	Wrong Answers	7	33,3	33,3	100,0
	Total	21	100,0	100,0	

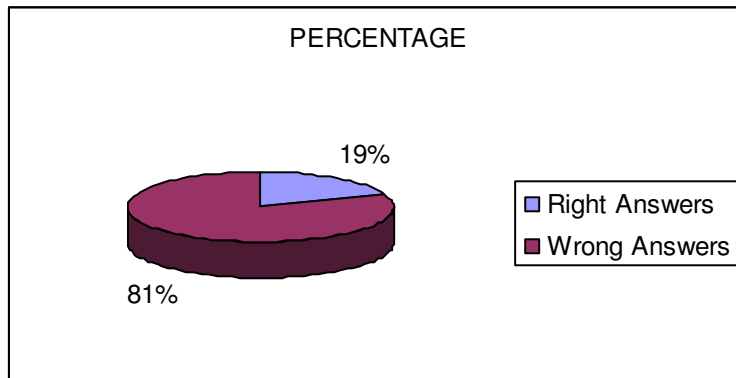
**GRAPHIC No. 18 Percentage Question 18**



**TABLE 19. Q19. Which of the listed requirements is NOT true regarded to work performed at another location?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	4	19,0	19,0	19,0
Wrong Answers	17	81,0	81,0	100,0
Total	21	100,0	100,0	

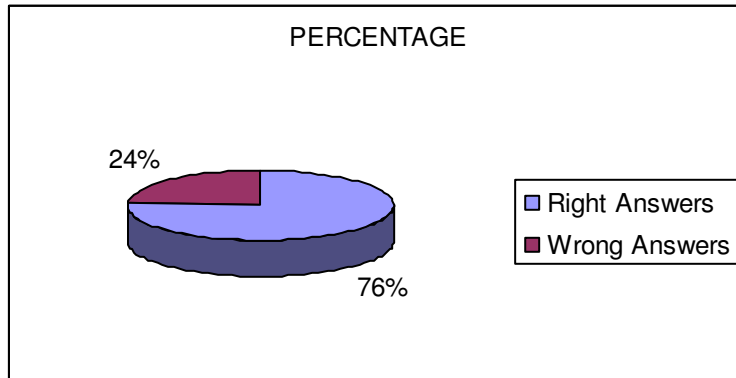
**GRAPHIC No. 19 Percentage Question 19**



**TABLE 20. Q20. The procedures for revising the training program required by 14E 63 and submitting revisions to the certificate holding district office for approval must be included in:**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	16	76,2	76,2	76,2
Wrong Answers	5	23,8	23,8	100,0
Total	21	100,0	100,0	

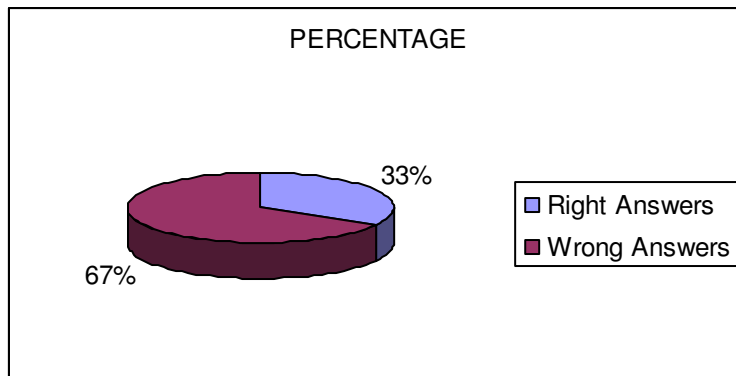
**GRAPHIC No. 20 Percentage Question 20**



**TABLE 21. Q21. A certificated repair station manual must include:**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	7	33,3	33,3	33,3
Wrong Answers	14	66,7	66,7	100,0
Total	21	100,0	100,0	

**GRAPHIC No. 21 Percentage Question 21**

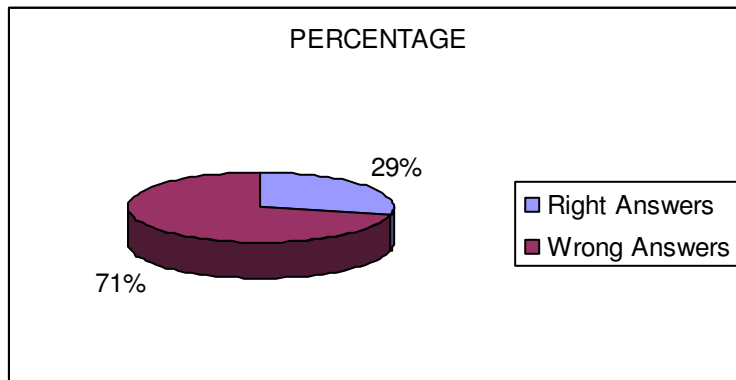


**TABLE 22. Q22. Which statement(s) is/are true regarding quality control system?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	6	28,6	28,6	28,6
Wrong Answers	15	71,4	71,4	100,0
Total	21	100,0	100,0	



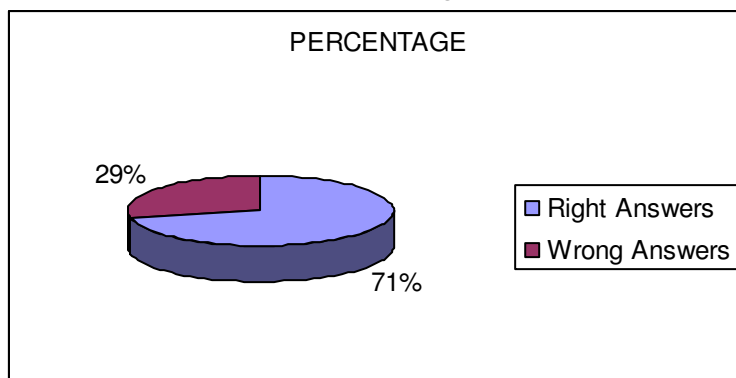
**GRAPHIC No. 22 Percentage Question 22**



**TABLE 23. Q23. What is the language in which a certified repair station must retain the records?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	15	71,4	71,4	71,4
Wrong Answers	6	28,6	28,6	100,0
Total	21	100,0	100,0	

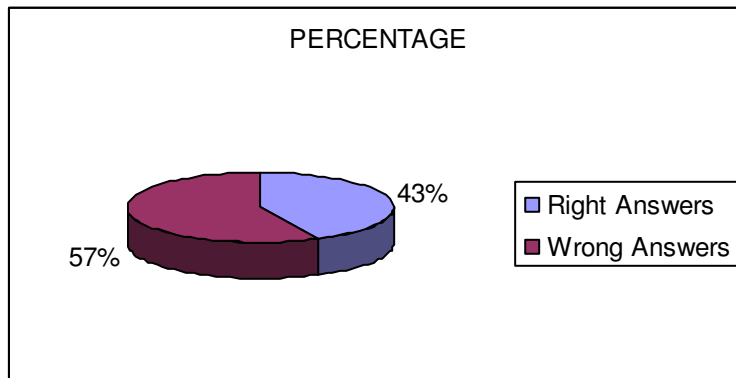
**GRAPHIC No. 23 Percentage Question 23**



**TABLE 24. Q24. When applying the sentence: "Only an employee certificated under part 65 is authorized to sign off on final inspections and maintenance releases for the repair station"?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	9	42,9	42,9	42,9
Wrong Answers	12	57,1	57,1	100,0
Total	21	100,0	100,0	

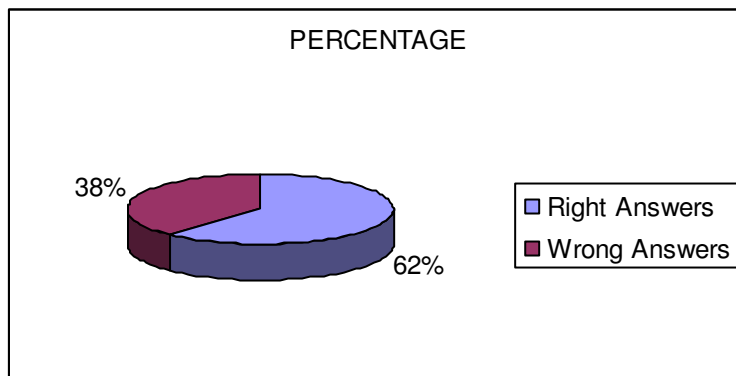
**GRAPHIC No. 24 Percentage Question 24**



**TABLE 25. Q25. How often the certificate holding district office will be notified of the capability list revision?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	13	61,9	61,9	61,9
Wrong Answers	8	38,1	38,1	100,0
Total	21	100,0	100,0	

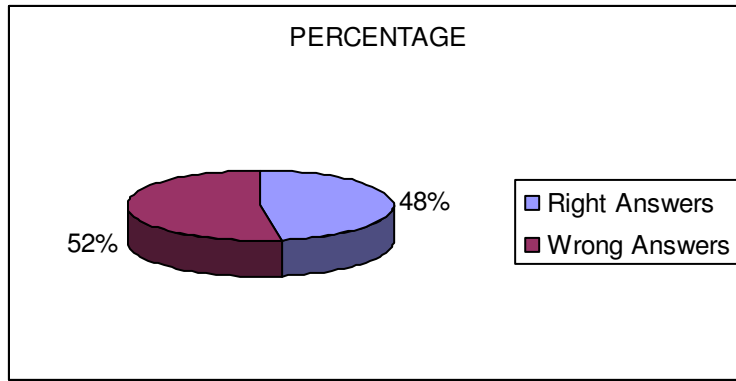
**GRAPHIC No. 25 Percentage Question 25**



**TABLE 26. Q26. Who remains directly in charge of the work performed by the noncertificated person?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	10	47,6	47,6	47,6
Wrong Answers	11	52,4	52,4	100,0
Total	21	100,0	100,0	

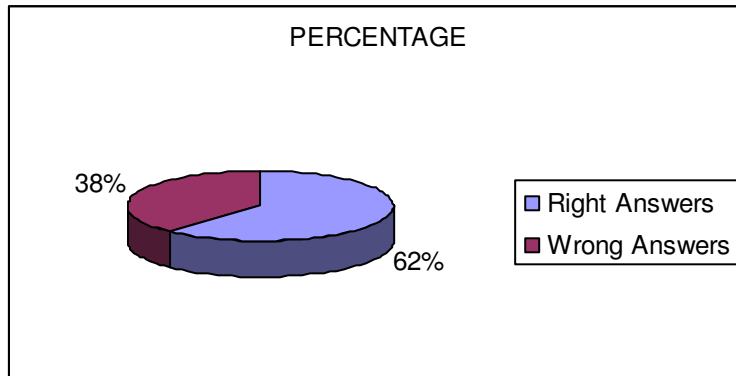
**GRAPHIC No. 26 Percentage Question 26**



**TABLE 27. Q27. Does the repair station need a procedure to revise the training program?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	13	61,9	61,9	61,9
	Wrong Answers	8	38,1	38,1	100,0
Total		21	100,0	100,0	

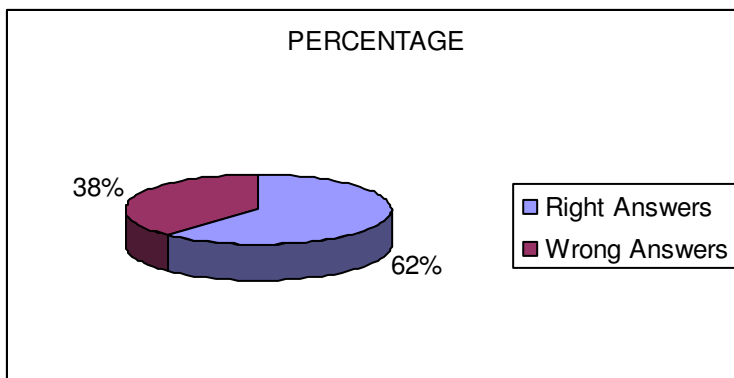
**GRAPHIC No. 27 Percentage Question 27**



**TABLE 28. Q28. Which manual must include a description of the required records and the recordkeeping system used to obtain, store, and retrieve the required records?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	13	61,9	61,9	61,9
	Wrong Answers	8	38,1	38,1	100,0
Total		21	100,0	100,0	

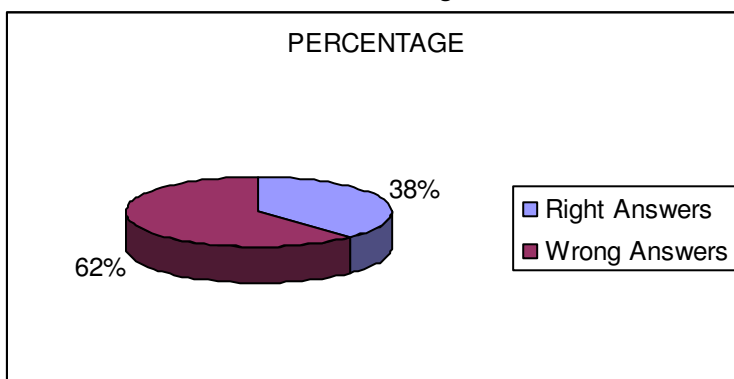
**GRAPHIC No. 28 Percentage Question 28**



**TABLE 29. Q29. What must a certificated repair station do if any serious failure, malfunction, or defect article is discovered?**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	8	38,1	38,1	38,1
Wrong Answers	13	61,9	61,9	100,0
Total	21	100,0	100,0	

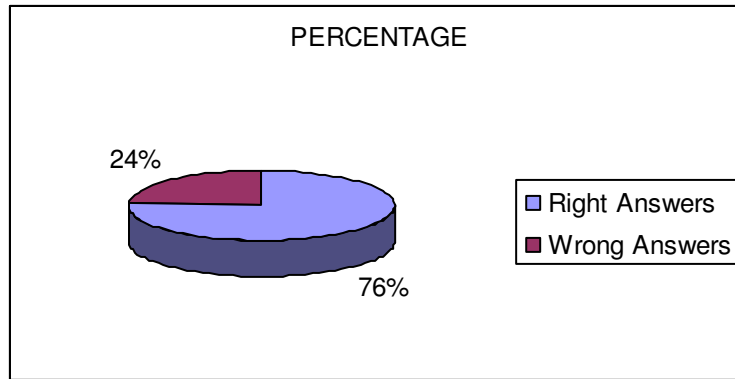
**GRAPHIC No. 29 Percentage Question 29**



**TABLE 30. Q30. The FAA inspections repair station that is located within and outside the United States will be developed:**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	16	76,2	76,2	76,2
Wrong Answers	5	23,8	23,8	100,0
Total	21	100,0	100,0	

**GRAPHIC No. 30 Percentage Question 30**

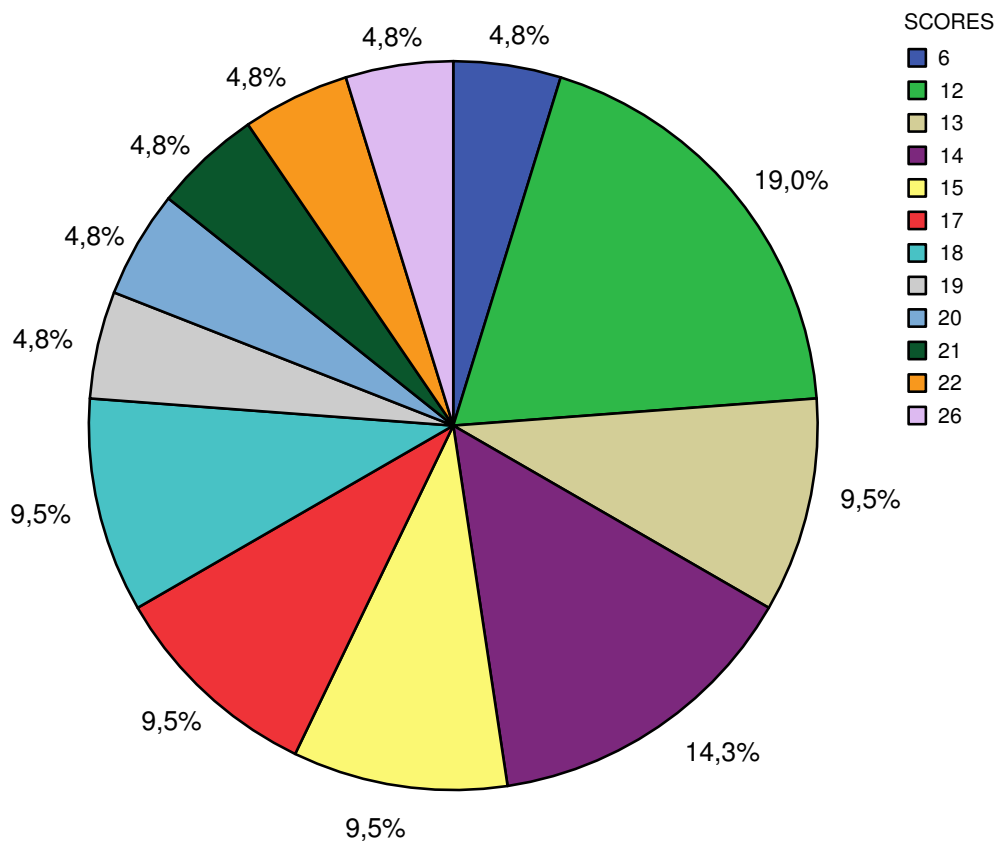


**b. Scores and Percentages of the FAR Test.**

**TABLE 31. Scores and Percentages of the FAR Test**

Score / 30	Personnel Frequency	Percent	Valid Percent	Cumulative Percent
Valid 6	1	4,8	4,8	4,8
12	4	19,0	19,0	23,8
13	2	9,5	9,5	33,3
14	3	14,3	14,3	47,6
15	2	9,5	9,5	57,1
17	2	9,5	9,5	66,7
18	2	9,5	9,5	76,2
19	1	4,8	4,8	81,0
20	1	4,8	4,8	85,7
21	1	4,8	4,8	90,5
22	1	4,8	4,8	95,2
26	1	4,8	4,8	100,0
Total	21	100,0	100,0	

**GRAPHIC No. 31 Scores and Percentages of the FAR Test**



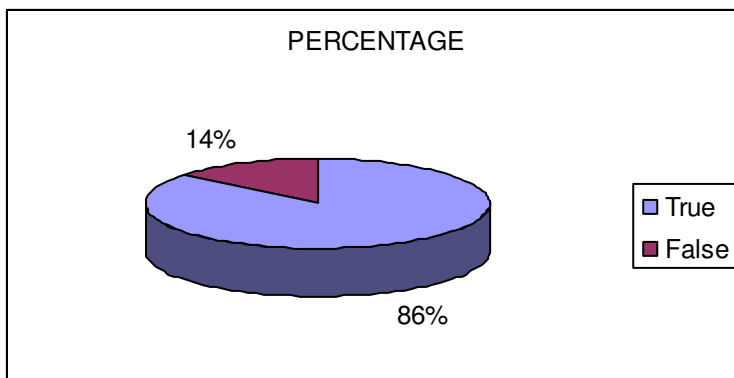
#### 4.1.2. Reading Comprehension Test Results

##### a. Results exposition by question

**TABLE 32. Q1. More people in the UK do not intend to get internet access than before.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	18	85,7	85,7	85,7
	False	3	14,3	14,3	100,0
	Total	21	100,0	100,0	

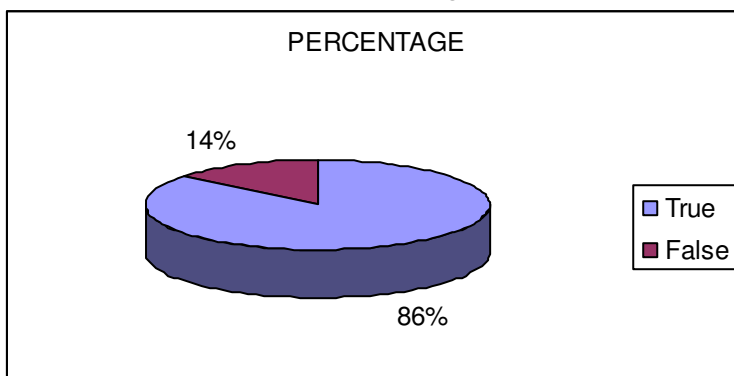
**GRAPHIC No. 32 Percentage Question 1**



**TABLE 33. Q2. The majority of people in the UK are 'net refuseniks'.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	18	85,7	85,7	85,7
	False	3	14,3	14,3	100,0
	Total	21	100,0	100,0	

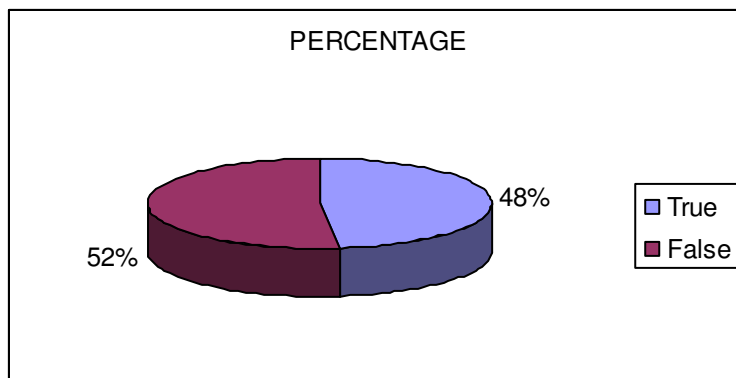
**GRAPHIC No. 33 Percentage Question 2**



**TABLE 34. Q3. Most of those without internet access want to get it.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	10	47,6	47,6	47,6
	False	11	52,4	52,4	100,0
	Total	21	100,0	100,0	

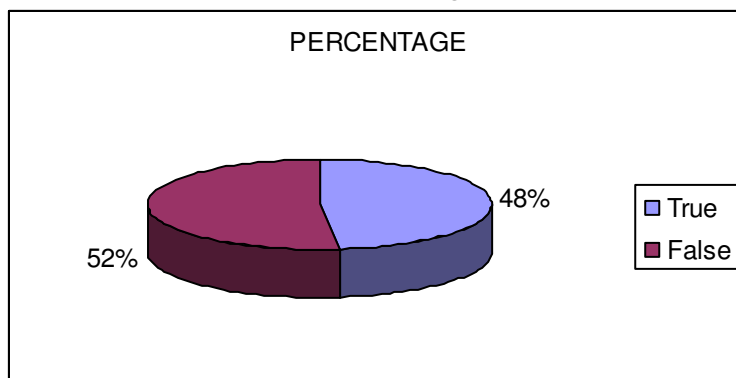
**GRAPHIC No. 34 Percentage Question 3**



**TABLE 35. Q4. The minority of the people surveyed in 2005 weren't interested in having internet access.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	11	52,4	52,4	52,4
	False	10	47,6	47,6	100,0
	Total	21	100,0	100,0	

**GRAPHIC No. 35 Percentage Question 4**

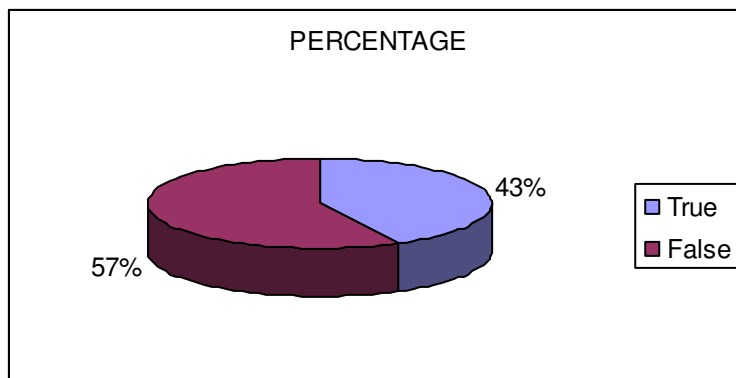


**TABLE 36. Q5. The main reason for not getting internet access is the cost.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	9	42,9	42,9	42,9
	False	12	57,1	57,1	100,0
	Total	21	100,0	100,0	



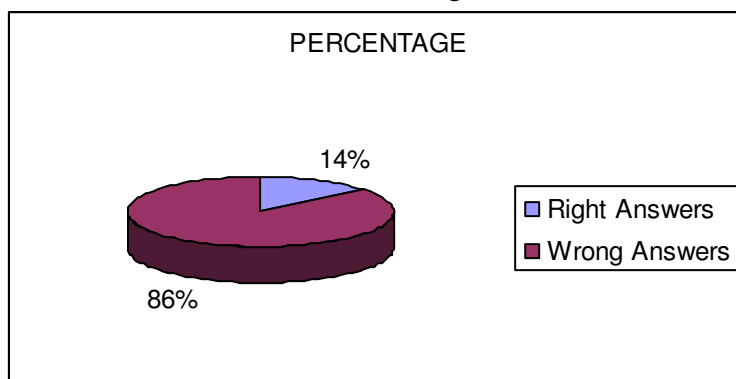
**GRAPHIC No. 36 Percentage Question 5**



**TABLE 37. Q6. According to the passage, television...**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	3	14,3	14,3	14,3
Wrong Answers	18	85,7	85,7	100,0
Total	21	100,0	100,0	

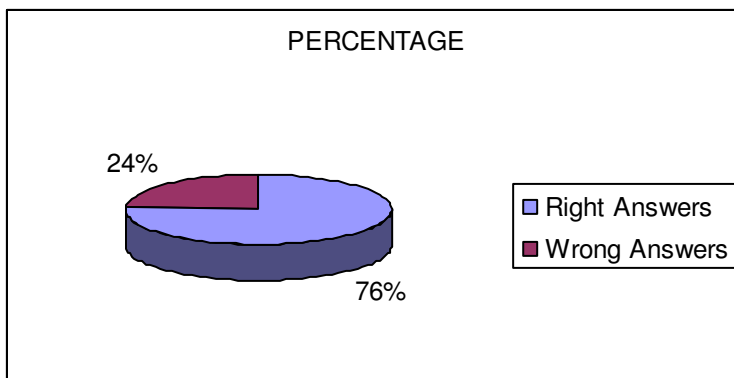
**GRAPHIC No. 37 Percentage Question 6**



**TABLE 38. Q7. It seems that many people...**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	16	76,2	76,2	76,2
Wrong Answers	5	23,8	23,8	100,0
Total	21	100,0	100,0	

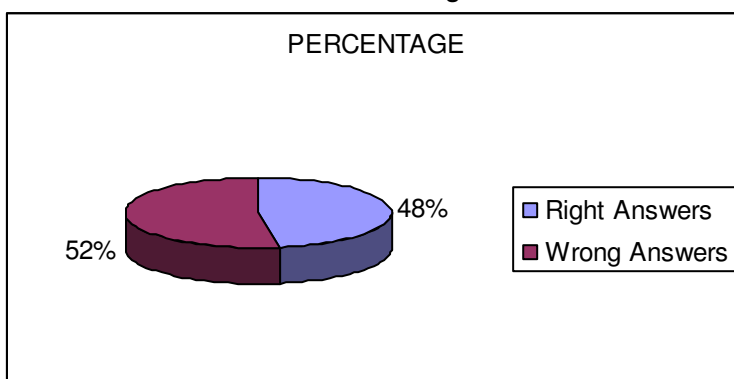
**GRAPHIC No. 38 Percentage Question 7**



**TABLE 39. Q8. According to the passage, today's culture...**

		Frequency	Percent
Missing	Right Answers	10	47,6
	Wrong Answers	11	52,4
Total		21	100,0

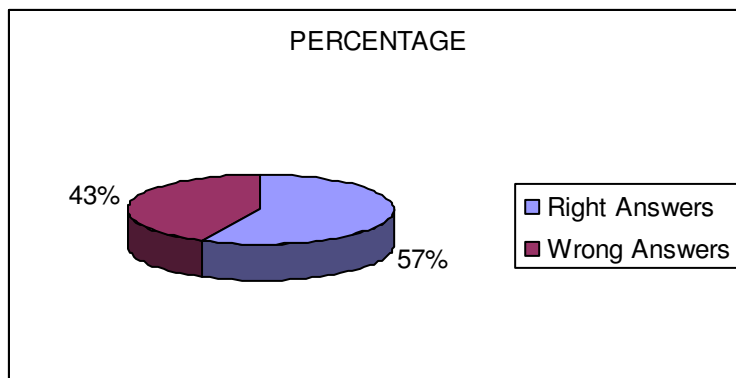
**GRAPHIC No. 39 Percentage Question 8**



**TABLE 40. Q9. From your reading of the passage, which of these statements about TV is not true?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	12	57,1	57,1	57,1
	Wrong Answers	9	42,9	42,9	100,0
Total		21	100,0	100,0	

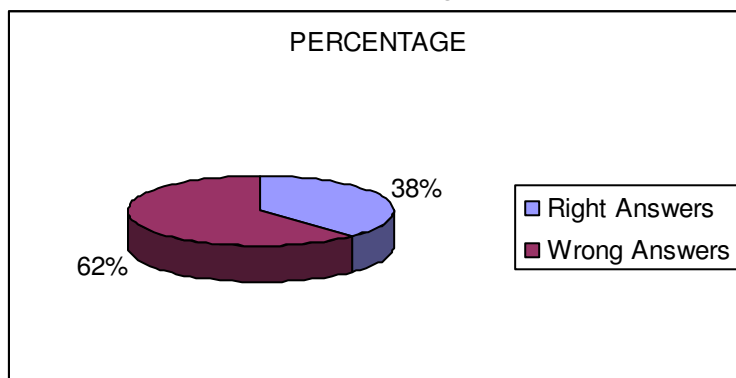
**GRAPHIC No. 40 Percentage Question 9**



**TABLE 41. Q10. In general, the writer of the passage thinks that...**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	8	38,1	38,1	38,1
Wrong Answers	13	61,9	61,9	100,0
Total	21	100,0	100,0	

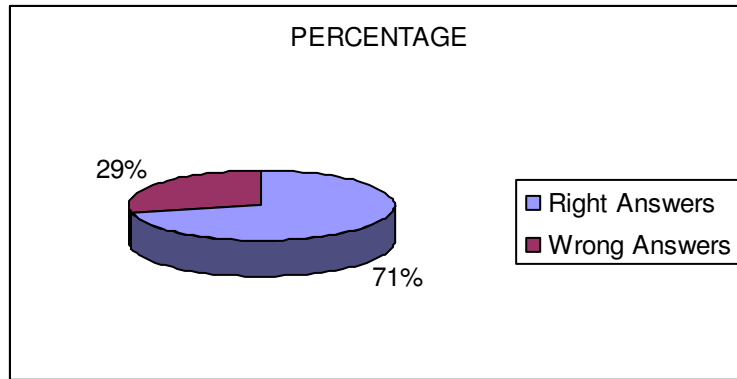
**GRAPHIC No. 41 Percentage Question 10**



**TABLE 42. Q11. The best job for Jane is ( )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	15	71,4	71,4	71,4
Wrong Answers	6	28,6	28,6	100,0
Total	21	100,0	100,0	

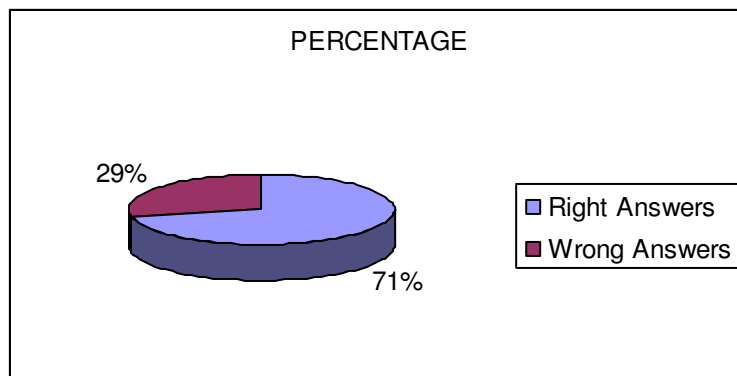
**GRAPHIC No. 42 Percentage Question 11**



**TABLE 43. Q12. The best job for Margaret is ( )**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	15	71,4	71,4	71,4
	Wrong Answers	6	28,6	28,6	100,0
Total		21	100,0	100,0	

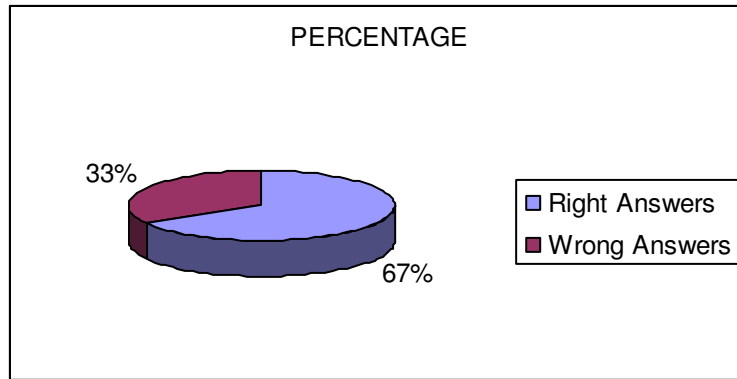
**GRAPHIC No. 43 Percentage Question 12**



**TABLE 44. Q13. The best job for Alice is ( )**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Right Answers	14	66,7	66,7	66,7
	Wrong Answers	7	33,3	33,3	100,0
Total		21	100,0	100,0	

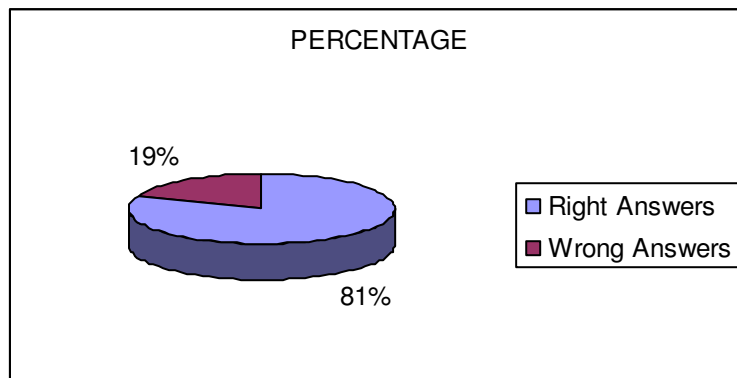
**GRAPHIC No. 44 Percentage Question 13**



**TABLE 45. Q14. The best job for Peter is ( )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	17	81,0	81,0	81,0
Wrong Answers	4	19,0	19,0	100,0
Total	21	100,0	100,0	

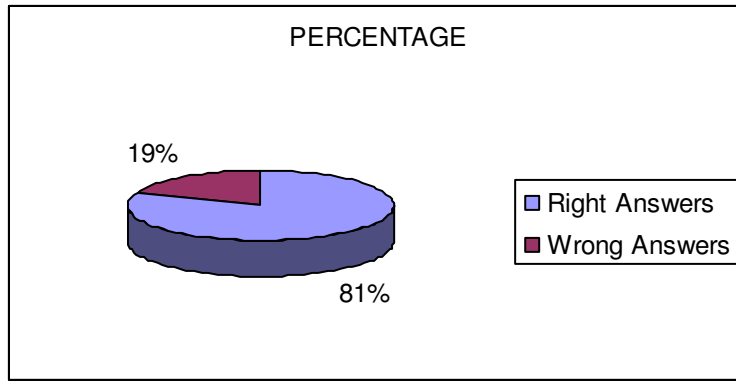
**GRAPHIC No. 45 Percentage Question 14**



**TABLE 46. Q15. The best job for Vincent is ( )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	17	81,0	81,0	81,0
Wrong Answers	4	19,0	19,0	100,0
Total	21	100,0	100,0	

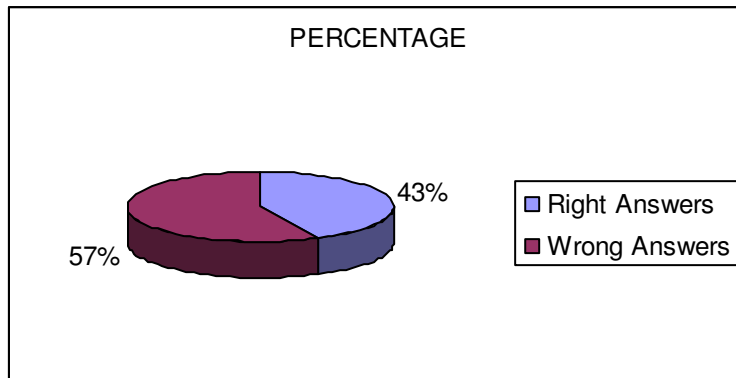
**GRAPHIC No. 46 Percentage Question 15**



**TABLE 47. Q16. Blank space 1**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	9	42,9	42,9	42,9
Wrong Answers	12	57,1	57,1	100,0
Total	21	100,0	100,0	

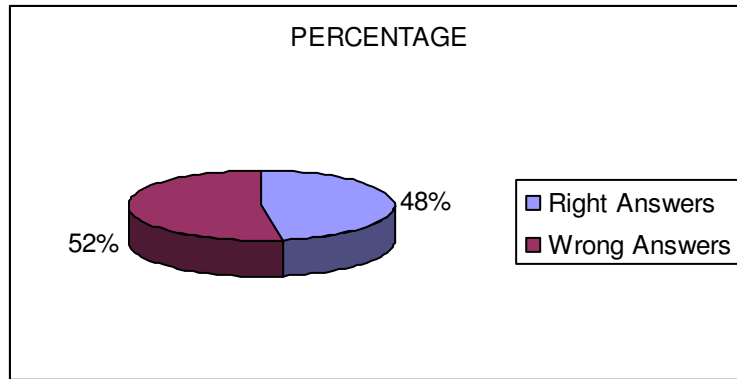
**GRAPHIC No. 47 Percentage Question 16**



**TABLE 48. Q17. Blank space 2**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	10	47,6	47,6	47,6
Wrong Answers	11	52,4	52,4	100,0
Total	21	100,0	100,0	

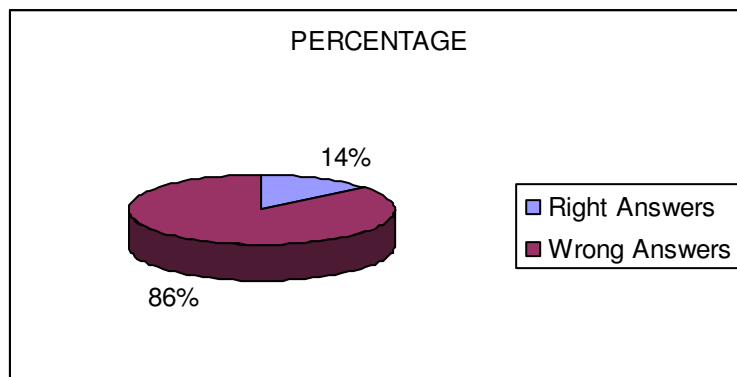
**GRAPHIC No. 48 Percentage Question 17**



**TABLE 49. Q18. Blank space 3**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	3	14,3	14,3	14,3
Wrong Answers	18	85,7	85,7	100,0
Total	21	100,0	100,0	

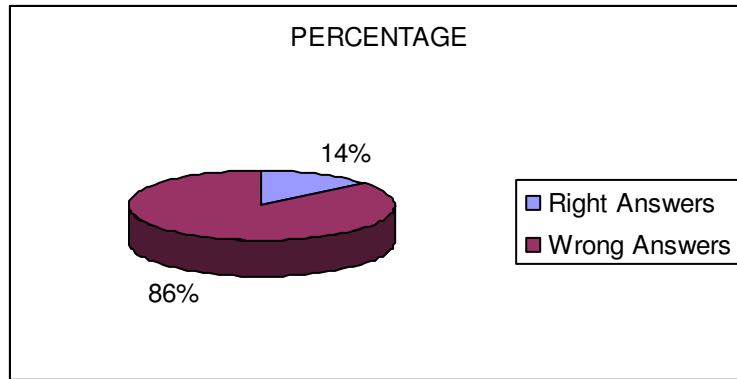
**GRAPHIC No. 49 Percentage Question 18**



**TABLE 50. Q19. Blank space 4**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	3	14,3	14,3	14,3
Wrong Answers	18	85,7	85,7	100,0
Total	21	100,0	100,0	

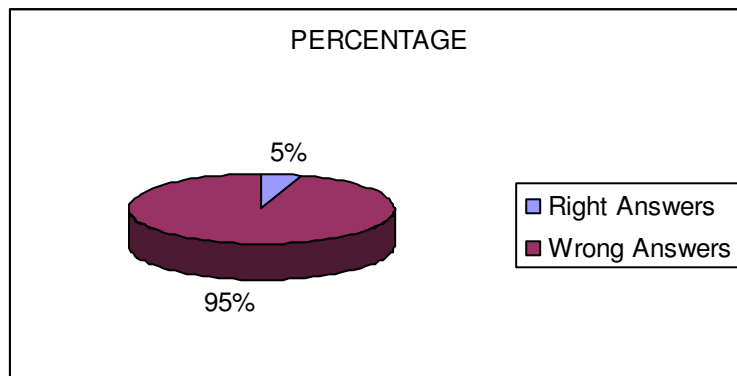
**GRAPHIC No. 50 Percentage Question 19**



**TABLE 51. Q20. Blank space 5**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	1	4,8	4,8	4,8
Wrong Answers	20	95,2	95,2	100,0
Total	21	100,0	100,0	

**GRAPHIC No. 51 Percentage Question 20**

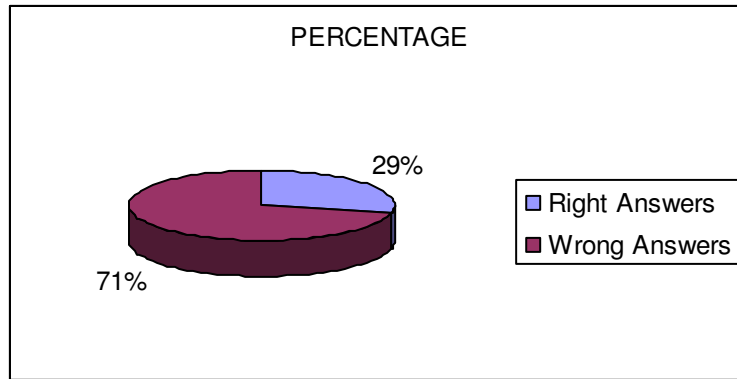


**TABLE 52. Q21. Blank space 6**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	6	28,6	28,6	28,6
Wrong Answers	15	71,4	71,4	100,0
Total	21	100,0	100,0	



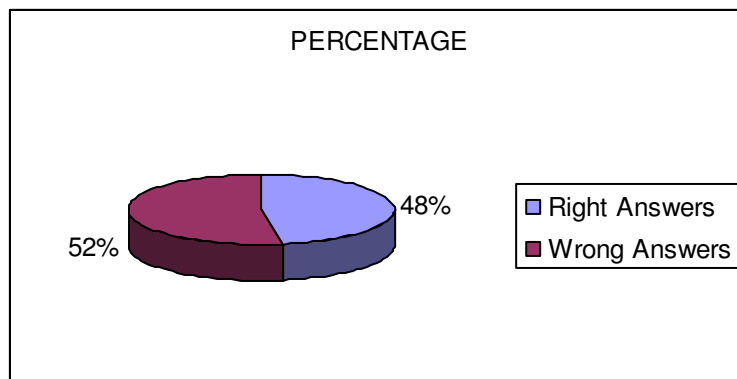
**GRAPHIC No. 52 Percentage Question 21**



**TABLE 53. Q22. Blank space 7**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	10	47,6	47,6	47,6
Wrong Answers	11	52,4	52,4	100,0
Total	21	100,0	100,0	

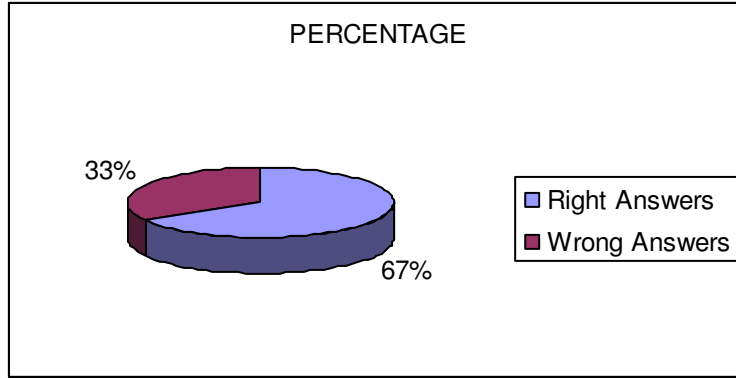
**GRAPHIC No. 53 Percentage Question 22**



**TABLE 54. Q23. Blank space 8**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	14	66,7	66,7	66,7
Wrong Answers	7	33,3	33,3	100,0
Total	21	100,0	100,0	

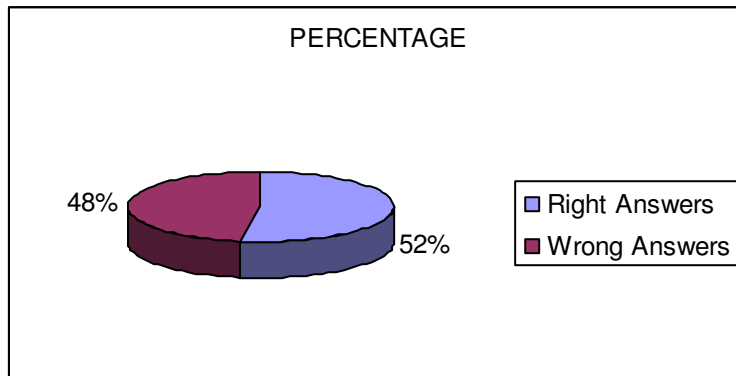
**GRAPHIC No. 54 Percentage Question 23**



**TABLE 55. Q24. Blank space 9**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	11	52,4	52,4	52,4
Wrong Answers	10	47,6	47,6	100,0
Total	21	100,0	100,0	

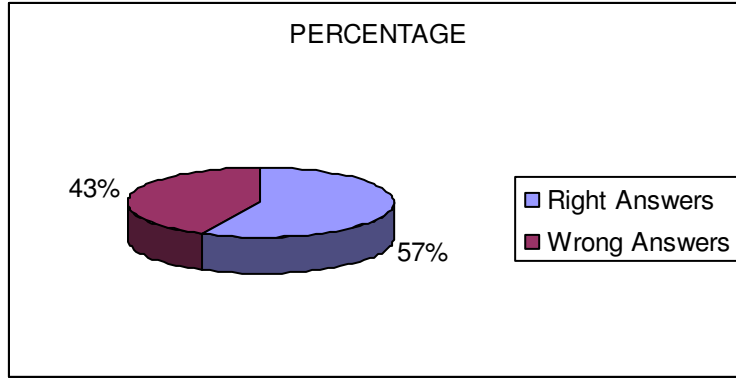
**GRAPHIC No. 55 Percentage Question 24**



**TABLE 56. Q25. Blank space 10**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	12	57,1	57,1	57,1
Wrong Answers	9	42,9	42,9	100,0
Total	21	100,0	100,0	

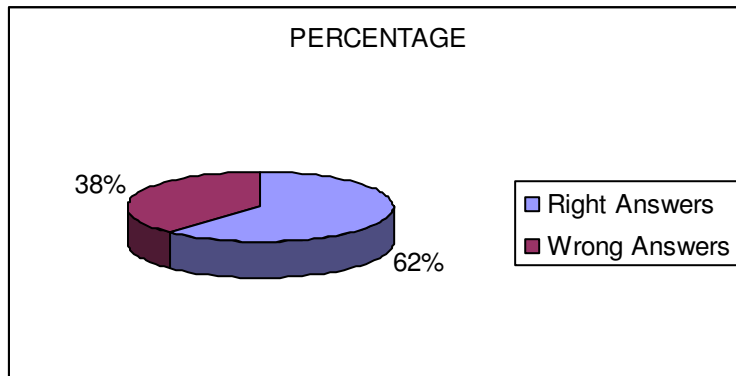
**GRAPHIC No. 56 Percentage Question 25**



**TABLE 57. Q26. Question ( 1 )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	13	61,9	61,9	61,9
Wrong Answers	8	38,1	38,1	100,0
Total	21	100,0	100,0	

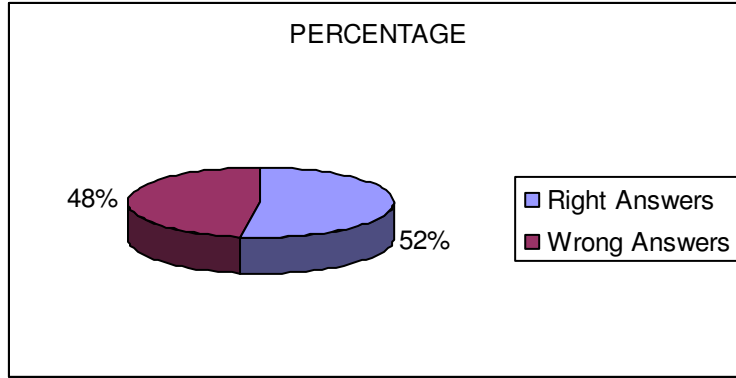
**GRAPHIC No. 57 Percentage Question 26**



**TABLE 58. Q27. Question ( 2 )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	11	52,4	52,4	52,4
Wrong Answers	10	47,6	47,6	100,0
Total	21	100,0	100,0	

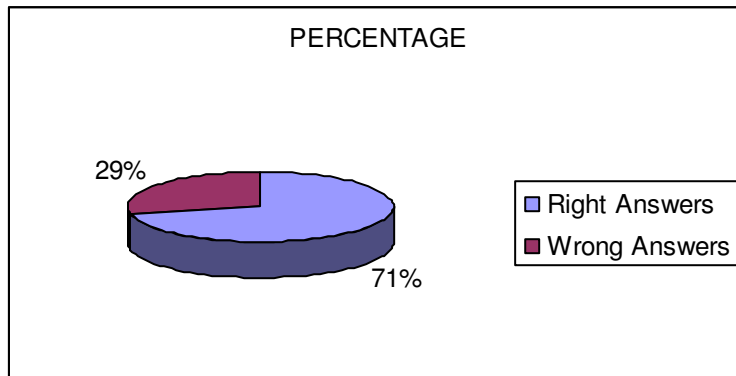
**GRAPHIC No. 58 Percentage Question 27**



**TABLE 59. Q28. Question ( 3 )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	15	71,4	71,4	71,4
Wrong Answers	6	28,6	28,6	100,0
Total	21	100,0	100,0	

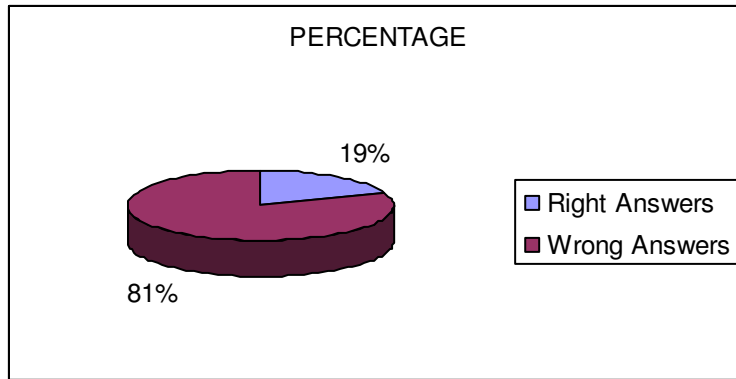
**GRAPHIC No. 59 Percentage Question 28**



**TABLE 60. Q29. Question ( 4 )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	4	19,0	19,0	19,0
Wrong Answers	17	81,0	81,0	100,0
Total	21	100,0	100,0	

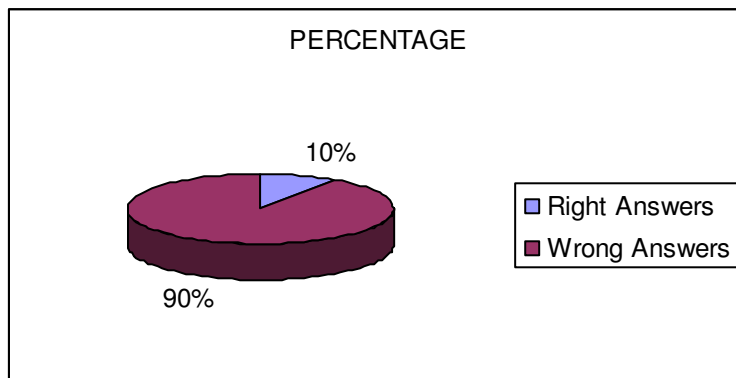
**GRAPHIC No. 60 Percentage Question 29**



**TABLE 61. Q30. Question ( 5 )**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Right Answers	2	9,5	9,5	9,5
Wrong Answers	19	90,5	90,5	100,0
Total	21	100,0	100,0	

**GRAPHIC No. 61 Percentage Question 30**

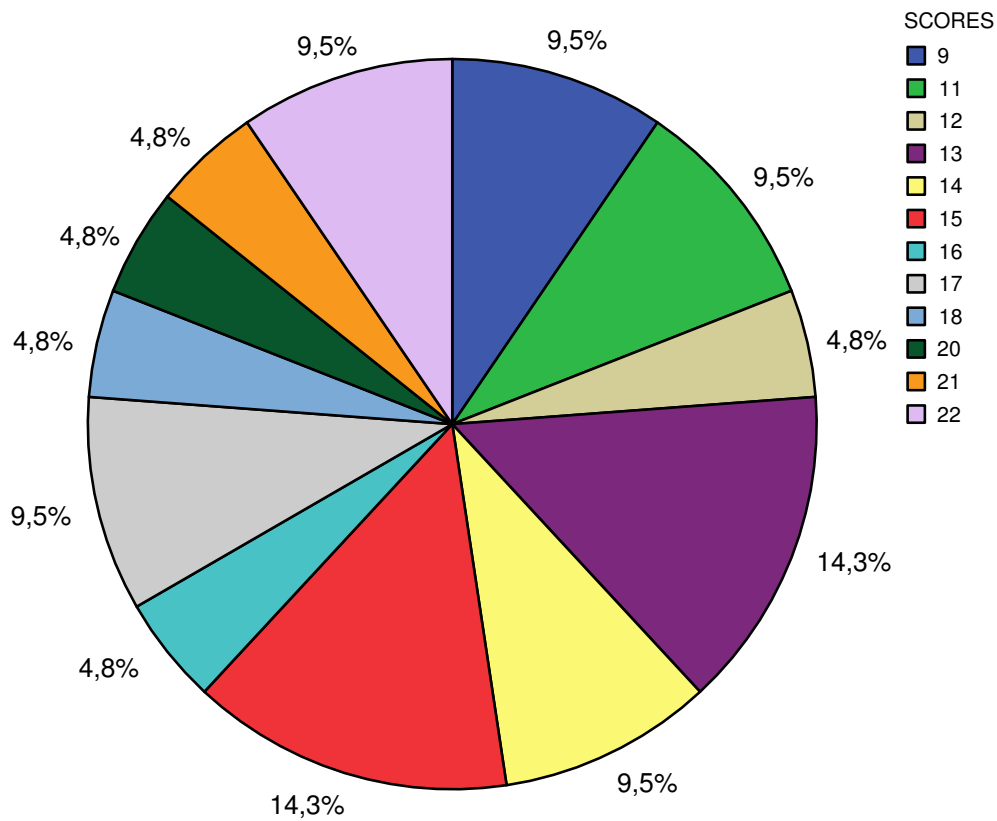


**b. Scores and Percentages of the Reading Comprehension Test.**

**TABLE 62. Scores and Percentages of the Reading Comprehension Test**

	Score / 30	Personnel Frequency	Percent	Valid Percent	Cumulative Percent
Valid	9	2	9,5	9,5	9,5
	11	2	9,5	9,5	19,0
	12	1	4,8	4,8	23,8
	13	3	14,3	14,3	38,1
	14	2	9,5	9,5	47,6
	15	3	14,3	14,3	61,9
	16	1	4,8	4,8	66,7
	17	2	9,5	9,5	76,2
	18	1	4,8	4,8	81,0
	20	1	4,8	4,8	85,7
	21	1	4,8	4,8	90,5
	22	2	9,5	9,5	100,0
Total		21	100,0	100,0	

**GRAPHIC No. 62 Scores and Percentages of the Reading Comprehension Test**



## 4.2. Analysis of Results

### a. General Results Exposition

The chart below shows the general scores obtained by the CEMEFA's personnel in FAR and Reading Comprehension Tests.

TABLE No. 63. Scores and Percentages of the X and Y variables

ITEM	(Y) VARIABLE FAR TEST SCORES	(X) VARIABLE READING COMPR TEST SCORES
1	17	16
2	22	21
3	17	17
4	15	14
5	12	9
6	21	20
7	15	13
8	26	22
9	6	9
10	12	15
11	20	18
12	14	13
13	14	17
14	13	11
15	18	13
16	12	14
17	18	15
18	19	22
19	14	15
20	12	11
21	13	12

### b. Statistical Calculation

In order to determine the relationship between the scores of the Reading Comprehension and FAR tests, we are going to use the statistical method or technique called CORRELATION.

It is important to know that when two variables vary together, statisticians say that there is a lot of covariation or correlation. The correlation coefficient, quantifies the direction and magnitude of correlation and the degree of linear association between two variables. It is typically denoted by “r” and will have a value ranging between negative 1 and positive 1. Correlation quantifies how well X and Y vary together. Correlation only makes sense when both X and Y variables are outcomes we measure. Correlation calculations do not discriminate between X and Y, but rather quantify the relationship between the two variables.

**TABLE No. 64. Data used to calculate the Pearson's Correlation Coefficient (r)**

IT	Y FAR TEST	X READ TEST	Y - $\bar{Y}$	X - $\bar{X}$	(Y- $\bar{Y}$ )*(X- $\bar{X}$ )	(Y - $\bar{Y}$ ) <sup>2</sup>	(X - $\bar{X}$ ) <sup>2</sup>
1	17	16	1,29	0,90	1,16	1,65	0,82
2	22	21	6,29	5,90	37,12	39,51	34,87
3	17	17	1,29	1,90	2,45	1,65	3,63
4	15	14	-0,71	-1,10	0,78	0,51	1,20
5	12	9	-3,71	-6,10	22,64	13,80	37,15
6	21	20	5,29	4,90	25,93	27,94	24,06
7	15	13	-0,71	-2,10	1,50	0,51	4,39
8	26	22	10,29	6,90	71,02	105,80	47,68
9	6	9	-9,71	-6,10	59,21	94,37	37,15
10	12	15	-3,71	-0,10	0,35	13,80	0,01
11	20	18	4,29	2,90	12,45	18,37	8,44
12	14	13	-1,71	-2,10	3,59	2,94	4,39
13	14	17	-1,71	1,90	-3,27	2,94	3,63
14	13	11	-2,71	-4,10	11,12	7,37	16,77
15	18	13	2,29	-2,10	-4,79	5,22	4,39
16	12	14	-3,71	-1,10	4,07	13,80	1,20
17	18	15	2,29	-0,10	-0,22	5,22	0,01
18	19	22	3,29	6,90	22,69	10,80	47,68
19	14	15	-1,71	-0,10	0,16	2,94	0,01
20	12	11	-3,71	-4,10	15,21	13,80	16,77
21	13	12	-2,71	-3,10	8,40	7,37	9,58

- **Mean:**

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$$

$$\bar{Y} = \frac{\sum_{i=1}^n Y_i}{n}$$

$$\bar{X}=15,10$$

$$\bar{Y}=15,71$$



- **Standard Deviation:**

$$s_x = \sqrt{\frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n-1}}$$

$$s_y = \sqrt{\frac{\sum_{i=1}^n (Y_i - \bar{Y})^2}{n-1}}$$

$$s_x = 3,90$$

$$s_y = 4,42$$

**TABLE No. 65. Standard Deviation Calculation**

	Mean	Std. Deviation	N
FAR Test	15,71	4,417	21
Reading Comprehension Test	15,10	3,897	21

- **Covariance:**

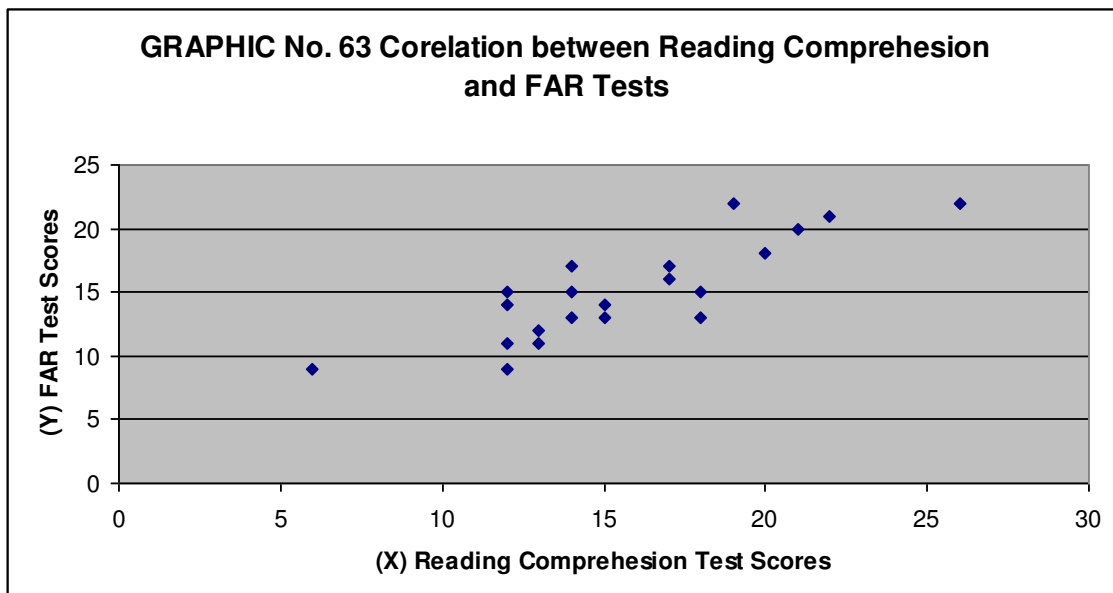
$$\text{Cov} = \frac{\sum (\bar{X} - X) * (\bar{Y} - Y)}{n-1}$$

$$\text{Cov} = 14.58$$

- **Correlation:**

$$r = \frac{\text{COV}}{s_x * s_y}$$

$$r = 0,846746$$



**TABLE No. 66. Correlation Calculation  
Correlations**

		FAR Test	Reading Comprehe nsion Test
FAR Test	Pearson Correlation	1	,847**
	Sig. (2-tailed)	.	,000
	N	21	21
Reading Comprehension Test	Pearson Correlation	,847**	1
	Sig. (2-tailed)	,000	.
	N	21	21

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### c. Analysis of Results

According to the results showed in the Table No. 64. Data used to calculate the Pearson's Correlation Coefficient, we can say that the average of X variable (reading comprehension) equal to 15.10 points is 50,33%; and the average of Y variable (FAR knowledge) equal to 15.71 points is 52,37%.

The results show us that the spread from the central tendency of Y variable (FAR knowledge) equal to 4,42 points is more distant than the X variable (reading comprehension) equal to 3.90 points.

The Y variable (FAR knowledge) and the X variable (reading comprehension) have a covariance equal to 14.51. Finally, the measure of the correlation between the two variables is 0.847.

### d. Hypothesis Testing for Correlation

#### Alternative Hypothesis Ho

The personnel's English reading comprehension level affect positively on the application process of the FAR 145\_Repair Stations.

### **Null Hypothesis H1**

The personnel's English reading comprehension level does not affect positively on the application process of the FAR 145\_Repair Stations.

### **Calculation to Hypothesis testing for “r”**

After the calculation of the Pearson correlation coefficient (r) we must determine whether this coefficient was statistically different from zero. For this calculation we are going to apply a test based on the distribution of t-Student.

$$\text{Standard Error } r = \sqrt{\frac{1 - r^2}{n - 2}}$$

If the calculated value ( $r = 0.847$ ) exceeds the value of the standard error multiplied by the t-Student with  $n-2$  degrees of freedom, we will say that the coefficient of correlation is significant.

The level of significance is given by the decision that we take when we seek the value in the table t-Student. In the case studied with a population of 21, the degrees of freedom are 19 and the value of the table t student for a safety 95% is 1.729 and 99% of the security value is 2.539. (Annex 3. T-Student Distribution Table.).

$$\text{Standard Error } r = \sqrt{\frac{1 - 0.847^2}{21 - 2}}$$

$$\text{Standard Error } r = 0.122$$

Since

$$r > (t - \text{Student value}) * (\text{S tan dar Error } r)$$

$$r > (1.729) * (0.122)$$

$$0.847 > 0.211$$

Then, we can ensure that the correlation coefficient was statistically significant ( $p < 0.05$ ).

If we apply the value in the table t-Student for a security of 99% ( $t = 2.539$ ) we note that  $r$  remains being mayor than the product, therefore we can ensure that the coefficient is statistically significant ( $p < 0.001$ ):

$$r > (t - \text{Student value}) * (\text{S tan dar Error } r)$$

$$r > (2.539) * (0.122)$$

$$0.847 > 0.309$$

### **Conclusion**

Once, we demonstrate that the correlation coefficient is statistically significant ( $p < 0.001$ ), we can reject the null hypothesis. It means that the work hypothesis is accepted as valid, that is to say, the personnel's English reading comprehension level affect positively on the application process of the FAR 145\_Repair Stations.

### **4.3. Conclusions**

Considering that the mean describes the central location of the data; we can conclude that the average of X variable (reading comprehension) is 50,33%, which means that people comprehend a half of what they read. It is important to say that the test applied was a mixture of part tests for beginners and intermediate English learners.

The average of Y variable (FAR knowledge) is 52,37%, thus, we can say that in general, people knows the FAR regulation for its application in a partial way, that means they do not have an exhaustive understanding of the information.

The standard deviation of the Y variable (FAR knowledge) indicates that the data points are far from the mean equal to 15.71 points, and the standard deviation of the X variable (Reading Comprehension) indicates that they are clustered closely around the mean equal to 15.10 points. In conclusion it demonstrates the level of the English comprehension is a little bit better than the FAR knowledge.

Taking in to account that the covariance is the measure of how much two random variables vary together, which measure in this case is different to zero (0), we can conclude that there is a lineal relation between the two variables studied.

As the covariance is a positive number of 14.53, here we can distinguish a positive lineal relation. It means that the low scores of the first variable X (reading comprehension) are associated with the low scores of second one Y (FAR knowledge); whereas the high scores of the first variable X (reading comprehension) are associated with high scores of the second one Y (FAR knowledge).

The correlation is studied through the Pearson's correlation coefficient. This varies between -1 and +1, and value equal 0 (zero) indicates a no correlation

between the variables. In this case, there exist a correlation because the value reaches a measure of 0,84. As the value of the correlation is approximate to +1, we conclude that there is a positive lineal relation between the X (reading comprehension) and Y (FAR knowledge) variables.

#### **4.4. Recommendations**

It is recommendable that the CEMEFA's Training Section programmes a continue English Language Course with the focus on Reading Comprehension, and one of the principal aims of this program must be that the CEMEFA's personnel reaches a satisfactory level proficiency.

It is recommendable that the principals motive the people with the objective they learn by themselves the FAA rules, specially the Part 145, due to this is the base of the Repair Station operation procedure, where everybody participate, additional the procedure outline the responsibilities of each person and define a method for checking how the work is being developed.

With the fact that the knowledge is always not complete, it is important that the CEMEFA's personnel, at least reaches an 80% of the information written in FAR regulation texts, according of the kind of tasks they perform. Thus, it must be important that the CEMEFA's Training section programmes a training plan directed to increase their knowledge and by default the correct application of them, gaining a better performance of each member and of the enterprise.

It is demonstrate that there is there is a lineal relation between the two variables reading comprehension and FAR knowledge, due to, it is recommendable through an continues English Course, improve both: comprehend what they read and increase the knowledge level and application of the FAA rules in the Electronic Center.

If there were one language that could have a chance of being considered universal, it would be English, so it is recommendable that the principals motive to the self-education in CEMEFA's personnel which will contribute to the personal and enterprise growth.

On the base of this research, it is recommendable to develop an assistance instrument that, in accordance with the current Federal Aviation Regulation (FAR), the internal policies, and procedures of CEMEFA helps and improves the daily work. This instrument should comply with FAR 145.211 (Quality Control Manual) and 145.213 (Inspection of maintenance, preventive maintenance, or alterations). Moreover, this tool will be revised whenever CEMEFA needs or as directed by the FAA.

## **PART FIVE**

### **THE PROPOSAL**

#### **5.1. Introduction**

It is so important that the CEMEFA's personnel be involved in their daily work with quality procedures and norms based in international rules, which will allow them to be in the same rout and reach the enterprise and personal goals.

The way of achieve this goal will be through the application of a developed and tested pedagogy of understanding which implies a framework that stresses in-depth learning. This framework provides teachers with a language and structure for planning their curriculum and for discussing teaching for understanding with other colleagues and with their students. At its core is a performance view of understanding: If a student "understands" a topic, she can not only reproduce knowledge, but also use it in unscripted ways. These situations are called "performances of understanding" because they give students the opportunity to demonstrate that they understand information, can expand upon it, and apply it in new ways.

On the base of this background, the proposal of this project is to develop a manual in an easy, precise, and concise way in order to assist the CEMEFA's personnel in the application of the Federal Aviation Regulations Part 145\_Repair Stations, and to search a way the CEMEFA's personnel to know and understand this instrument. But it is remarkable that this manual will not replace the FAA rules, it will be just a simple compile of the procedures as a guide required to carry out the daily work.



It is absolutely necessary to achieve the most basic goal of teaching the manual, preparing CEMEFA's workers for further learning and more effective functioning in their professional lives.

## **5.2. General Objective**

To develop a manual in an easy, precise, and concise way in order to assist the CEMEFA's personnel in the application of the Federal Aviation Regulations Part 145\_Rpair Stations, and to search a way they know and understand this instrument.

## **5.3. Specific Objective**

To develop a manual which should be thought through a Teaching for Understanding pedagogy theory that allows CEMEFA's personnel to understand information, expand upon it, and apply it at daily work.

## **5.4. What is Teaching for Understanding?**

The constructivist view of effective classroom instruction is often called 'teaching for understanding,' and research on this topic has become a priority for educational policy makers. The importance of this form of teaching lies in its potential to enhance the kinds of cognitive outcomes for students that the educational system has heretofore been notoriously ineffective at producing. While our schools have been relatively successful in engendering basic-skills achievement, they have not done well in promoting students' success in tasks variously described as problem solving, critical analysis, higher-order thinking, or flexible understanding of academic subject matter- learning outcomes associated with teaching for understanding.

For educators, it is important to know how deep understanding is acquired. This knowledge helps the students in the development of their own understandings. Teaching for Understanding focuses on understanding, deep knowing, rigor and depth, important principles that underpin the Essential Learnings.

Teaching for Understanding (TfU) had its beginnings in 1988 when Howard Gardner, David Perkins and Vito Perrone from the Harvard Graduate School of Education began a dialogue around the following questions:

- What does it mean to understand something?
- How do we develop understanding?
- What do we need to understand?

As a result of these discussions a five year research project was designed. Its purpose was to develop a research based, classroom tested approach to teaching for understanding. The Teaching for Understanding Guide, written in 1998 by Tina Blythe and her associates at Harvard Project Zero, is an outcome of this research.

#### **5.4.1. Epistemological base of Teaching for Understanding**

Epistemology or theory of knowledge is the branch of philosophy that studies the nature, methods, limitations, and validity of knowledge and belief. The term "epistemology" is based on the Greek words "ἐπιστήμη or episteme" (knowledge or science) and "λόγος or logos" (reason). It was introduced into English by the Scottish philosopher James Frederick Ferrier (1808-1864).

Much of the debate in this field has focused on analyzing the nature of knowledge and how it relates to similar notions such as truth, belief, and justification. It also deals with the means of production of knowledge, as well as skepticism about different knowledge claims. In other words, epistemology primarily addresses the following questions: "What is knowledge?", "How is knowledge acquired?", and "What do people know?"

David Perkins, American Educator and one of the principal investigators of the Project Zero, has conducted long-term programs of research and development in the areas of teaching and learning for understanding, creativity, problem-solving and reasoning in the arts, sciences, and everyday life. He has also studied the role of educational technologies in teaching and learning, and has designed learning structures and strategies in organizations to facilitate personal and organizational understanding and intelligence. These inquiries reflect a conception of mind that emphasizes the interlocking relationships among thinking, learning, and understanding. The three depend deeply on one another. Meaningful learning aims at understanding and depends on thinking with and about what one is learning. Effective thinking in the subject matters and in general involves understanding the resources of the mind and learning to deploy them sensitively and systematically.

#### **5.4.2. Psychological Base of Teaching for Understanding**

Psychology is one of the behavioral sciences—a broad field that spans the social and natural sciences. Psychology attempts to understand the role human behavior plays in social dynamics while incorporating physiological and neurological processes into its conceptions of mental functioning. Psychology includes many sub-fields of study and

application concerned with such areas as human development, sports, health, industry, law, and spirituality.

The power of the mimetic tradition in education rests with the historical influence of behavioral psychology, exemplified primarily by the work of Thorndike and Skinner. The work of these theorists "described human behavior essentially by the stimulus-response relationship coupled with positive reinforcement of desired behavior and negative reinforcement of unwanted behavior". Thus, learning has come to mean memorizing and repeating new information. Student accountability can be accomplished by using multiple-choice or short-answer questions; learning can be documented by assigning grades and establishing percentile scores.

Although the focus on developmental cognitive growth in schools has recognized a progression of complexity, it frequently does not recognize the plurality of intelligence. However, Howard Gardner (1983) has described the relationship between the plurality of meaning (knowledge) and the plurality of intelligence in his discussion of Piaget.

While Piaget's developmental cognitive structure has enriched the instructional process, that structure, according to Eisner, has also reinforced a narrow view of knowledge and intelligence which has limited other options. A cognitive structure with logical-mathematical intelligence as the goal, diminishes other areas of skill and creativity. According to Gardner (1991) the consequences of this cognitive tradition for instruction, curriculum, assessment, and for our understanding of student capacity are clear.

According to Gardner and other critics, many successful students in the past have not possessed critical thinking, problem-solving, collaborative, and communication skills. More importantly, these students have had great difficulty applying their knowledge in new situations.

A knowledge system embracing multiple meanings and understandings requires a parallel view of learning and intelligence. Howard Gardner's conception of learning and knowledge provides a theoretical framework for the constructivist model of teaching and learning. Intelligence, according to Gardner, is something one does. The seven intelligences identified by Gardner are not just talents, but they offer a range of socially acceptable ways of solving problems. In the constructivist view, then, not only are multiple correct answers to a given problem possible, but the human mind has the capacity to address a given problem from multiple perspectives. In a "teaching for understanding" classroom students might exhibit their understanding of the content in a number of unique ways. Gardner's work suggests that a single indicator of student competence is not appropriate.

Gardner's theory of cognitive pluralism also provides a rationale for the emphasis on prior student knowledge in the constructivist knowledge framework. According to Gardner's research, by the age of five or six, children have developed robust "theories" of mind, matter, life, and self that are serviceable and powerful. While these explanations or theories may be naive and simplistic, they tend to be ignored by many teachers once formal education begins. These naive explanations of how the world works may not disappear as a consequence of school work. They merely go "underground" as students study and learn only to re-emerge in later life. Naive prior

knowledge must be surfaced and put into direct tension with disciplinary knowledge if these naive explanatory structures are to be changed.

#### **5.4.3. Sociological Base of Teaching for Understanding**

The central themes of constructivism come to education from sociology, psychology, and philosophy. The early work of Berger and Luckmann (1966) in sociology introduced the concept of the social construction of reality. These authors argued that each human being must inevitably develop or construct meaning. That is, each of us must "make meaning" or make sense of our own social world. Knowledge, then, is the result of the individual construction or "sense-making" of reality. In life, as in the classroom, each person receives information and looks at it in terms of her current understanding. For example, thirty children who hear a reading of a classic fairy tale will emerge with thirty distinct mental images. Madeline Grumet suggests that it is this construction, this "dance between the student's experience and knowledge, that separates education from training or indoctrination".

The contribution of Berger and Luckmann to the sociology of knowledge is a reminder that knowledge is socially constructed, that it is problematic and not given. However, most educators and non-educators tend to ascribe "givenness" to knowledge or information in the taken-for-granted, commonsensical manner in which subjects are taught. The authority of the textbook, a film, a news story, or an expert's interpretation of an event is seldom subjected to critical scrutiny. Often the skills necessary to engage in such scrutiny are neglected as well. Students tend to emerge from the schools with the unstated assumption that knowledge and human institutions are something other

than the products of human activity or agency; they tend to view themselves as products of and not producers of knowledge and institutions.

### **5.5. Planning for Teaching for Understanding. Lesson Plans.**

We must think of a unit of work we are, have been or will be teaching and record the following information.

- What are the main objectives/aims/intentions of the unit of work?
- How have you articulated this/these?
- What activities have you planned to help achieve your intention?
- How will you assess the unit of work?

According to the chapter 3 of The Teaching for Understanding Guide, in the light of your reading record your thoughts using the following headings:

- What is the Generative Topic?
- What value/s do I want the students to develop from studying this unit of work?
- What purpose/s am I addressing by studying this unit of work?
- What is/are the Understanding Goal/s?
- What are the Performances of Understanding that will develop and demonstrate my students' understanding?
- What ongoing assessment will I use to give my students continual feedback on their performance?

Teaching for Understanding is not a linear process. Educators may choose to begin anywhere within the process. Some people like to start with 'Big ideas' so they may start

at the Throughline level, others like to begin with the activities they have created for students which means they would begin with the Performances of Understanding.

Performances of Understanding are the activities, tasks or assignments students will complete in order to learn what you want them to understand (Understanding Goals).

Performances of Understanding are different from activities. Some tie more closely to the topic than others and foster more understanding than others. What makes the Performances of Understanding different is:

- They are activities that require students to use what they know to build and show their understanding of units and/or learning sequences.
- They are directly aimed at enhancing student understanding of one or more of your Understanding Goals.

As you create the Performances of Understanding you should look at each one carefully and judge how closely related it is to the Understanding Goals. How much do they do to further demonstrate student understanding?

Performances of Understanding are activities that require students to use what they know in new ways or situations to build on their understanding of units and learning sequences. They help students build and demonstrate their understanding. They require students to show their understanding in an observable way. Performances of Understanding involve students publicly demonstrating their understanding.



Understanding Goals inform what students should understand. Performances of Understanding are what students do to develop those understandings.

Sometimes these Performances of Understanding are divided into three sequential sections:

**a. Introductory Performances**

These are the performances of understanding that usually come first in a unit. They give your students a chance to explore the generative topic a bit. They also give you an opportunity to gauge students' current understanding of the topic. The possibilities for connections between students' personal interests and the topic emerge from these explorations.

**b. Guided Inquiry Performances**

In these kinds of performances of understanding, students focus on developing their understanding of particular problems or aspects of the generative topic that you feel are especially important. Guided inquiry performances typically occur in the middle of units.

**c. Culminating Performances**

These more complex, concluding performances of understanding give students a chance to synthesize and demonstrate the understandings they developed through the other performances of understanding.



## LESSON PLAN 1

1. **Subject:** Repair Station “English Manual” (RSM).
2. **Didactic unit:** One (1).
3. **Objectives:** To support students in the development of their own understandings of the RSM regulations and procedures choosing the core concepts, ideas and skills from among the set of information the personnel encounter in it.
4. **Theme:** General information.
5. **Methodology:** Teaching for comprehension.
6. **Course:** CEMEFAs technician personnel.
7. **Time:**
8. **Date:**

CONTENTS	ACTIVITIES	RESOURCES	EVALUATION
<p><b>Cognitive</b> Repair Station Manual Overview, References, Requirements, and Organization; Record of revision, Revision procedures, Glossary (terminology).</p> <p><b>Procedural</b> Reading: How to use this Manual.</p>	<ul style="list-style-type: none"> <li>• <b>Introductory Performances.</b> Conduct a think/pair/share activity and ask Ss to make individual notes and expositions of what Federal Aviation Regulation (FAA) and Advisory Circular (AC) 145-9 are; the meanings for some terminology like Class Ratings, Corrective Action, Limited Ratings, Line</li> </ul>	<ul style="list-style-type: none"> <li>- Repair Station “English Manual” (RSM).</li> <li>- FAR Part 145.207</li> <li>- FAR Part 145.209</li> <li>- AC 145-9</li> <li>- The Teaching for Understanding Guide.</li> <li>- Data projector.</li> <li>- Blackboard.</li> </ul>	<p>Ask Ss to demonstrate orally the understandings they developed through the different tasks made in the class: concepts, requirements, procedures, terminology, etc.</p>

<p>Writing: Concepts, Definitions, Procedures, etc. summary.</p> <p>Speaking: Make a exposition of the understandings</p> <p><b>Attitudes</b></p> <p>Discussion point.</p>	<p>Maintenance, etc.</p> <ul style="list-style-type: none"> <li>• <b>Guided Inquiry Performances.</b> After facilitator exposition, ask people to divide into groups of four to briefly discuss these topics under his supervision.</li> <li>• <b>Culminating Performances</b> Ask Ss to synthesize the understandings they developed through the different tasks made in the class.</li> </ul> <p>Using the Values and Purposes as a discussion point, ask participants to record their understandings in a series of statements on the 'Reflections About' sheet.</p>	<p>- Markers.</p>	
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## LESSON PLAN 2

1. **Subject:** Repair Station “English Manual” (RSM).
2. **Didactic unit:** Two (2).
3. **Objectives:** To support students in the development of their own understandings of the RSM regulations and procedures choosing the core concepts, ideas and skills from among the set of information the personnel encounter in it.
4. **Theme:** Documents, structure organization, duties and responsibilities.
5. **Methodology:** Teaching for comprehension.
6. **Course:** CEMEFAs technician personnel.
7. **Time:**
9. **Date:**

CONTENTS	ACTIVITIES	RESOURCES	EVALUATION
<b>Cognitive</b> Document control, Identification and control, Initial distribution, Revisions, Revisions distributions, Correction procedures, Organization and management, Structure description, Duties and responsibilities, Personnel.	<ul style="list-style-type: none"> <li>• <b>Introductory Performances.</b>  Conduct a think/pair/share activity and ask Ss to make individual notes and expositions of what the main and essential documents are.  Ask people to itemize the duties and responsibilities for their own positions.</li> </ul>	<ul style="list-style-type: none"> <li>- Repair Station “English Manual” (RSM).</li> <li>- FAR Part 145.207 FAR Part 145.209 AC 145-9</li> <li>- The Teaching for Understanding Guide.</li> <li>- Data projector.</li> </ul>	Ask Ss to demonstrate orally the understandings they developed through the different tasks made in the class: concepts, main and essential documents, structure, terminology, and their own duties, etc.

<p><b>Procedural</b>  Reading: Duties and responsibilities.  Writing: Concepts, Definitions, Procedures, etc. summary.  Speaking: Make a exposition of the understandings</p> <p><b>Attitudes</b>  Discussion point.</p>	<ul style="list-style-type: none"> <li>• <b>Guided Inquiry Performances.</b>  After facilitator exposition, ask people to divide into groups of four to briefly discuss these topics under his supervision.</li> <li>• <b>Culminating Performances</b>  Ask Ss to synthesize the understandings they developed through the different tasks made in the class.</li> </ul> <p>Using the Values and Purposes as a discussion point, ask participants to record their understandings in a series of statements on the 'Reflections About' sheet.</p>	<ul style="list-style-type: none"> <li>- Blackboard.</li> <li>- Markers.</li> </ul>	
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### LESSON PLAN 3

1. **Subject:** Repair Station “English Manual” (RSM).
2. **Didactic unit:** Three (3).
3. **Objectives:** To support students in the development of their own understandings of the RSM regulations and procedures choosing the core concepts, ideas and skills from among the set of information the personnel encounter in it.
4. **Theme:** Operations.
5. **Methodology:** Teaching for comprehension.
6. **Course:** CEMEFA’s technician personnel.
7. **Time:**
8. **Date:**

CONTENTS	ACTIVITIES	RESOURCES	EVALUATION
<b>Cognitive</b> Description of Operations, Work Flow, Housing and Facilities, Equipment and Materials, Determination Tools & Equipment, Capability List, Training Program, Training sources, Work performed as another location, Maintenance for	<ul style="list-style-type: none"> <li>• <b>Introductory Performances.</b>                Conduct a think/pair/share activity and ask Ss to make a brief description of what the CEMEFA Operations are.                Ask people to describe a general Work Flow of the Repair Station operations.</li> </ul>	<ul style="list-style-type: none"> <li>- Repair Station “English Manual” (RSM).</li> <li>- FAR Part 145.207 FAR Part 145.209 AC 145-9</li> <li>- The Teaching for Understanding Guide.</li> <li>- Data projector.</li> </ul>	Ask Ss to demonstrate orally the understandings they developed through the CEMEFA Work Flow Chart.

<p>Air Carriers, Contract Maintenance, Record and Record keeping.</p> <p><b>Procedural</b>  Reading: Description of Operations.  Writing: Concepts, Definitions, Procedures, etc. summary.  Speaking: Make a exposition of the understandings.</p> <p><b>Attitudes</b>  Discussion point.</p>	<ul style="list-style-type: none"> <li>• <b>Guided Inquiry Performances.</b>  After facilitator exposition, ask people to divide into groups of four to briefly discuss these topics under his supervision.</li> <li>• <b>Culminating Performances</b>  Ask Ss to synthesize the understandings they developed through the different tasks made in the class.</li> </ul> <p>Ask the Ss to make the CEMEFA Work Flow Chart.</p> <p>Using the Values and Purposes as a discussion point, ask participants to record their understandings in a series of statements on the 'Reflections About' sheet.</p>	<ul style="list-style-type: none"> <li>- Blackboard.</li> <li>- Markers.</li> </ul>	
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# MANUAL

## **1. GENERAL**

### **Overview**

This REPAIR STATION MANUAL (RSM) has been developed in accordance with the current Federal Aviation Regulation (FAA), Advisory Circular (AC) 145-9 and the internal policies and procedures of Electronic Maintenance Center (CEMEFA).

### **References**

FAR Part 145.207, FAR Part 145.209, and AC 145-9

### **Requirements**

This RSM complies with FAR 145.207 (Repair Station Manual), 145.209 (Repair Station Manual contents) and AC 145-9 (Guide for developing and evaluating repair station and quality control manuals) for requirements and content. In addition, this RSM will be revised whenever an addition or deletion of text or procedure is required, either due to a CEMEFA necessity or as directed by the FAA.

This manual explains the operations and organizational aspects of the repair station as specified in FAR 145.207 and 145.209.

The general repair will be performed in accordance with current FAA regulations, manufacturer's data, drawings, specifications and bulletins, and/or any other technical data approved by the FAA.

This manual in addition to the technical data required for the operation of the repair station will be maintained current and available all the time.

CEMEFA will not maintain or alter any item for which is not rated, and will not or alter any item for which it is rated which requires technical data, equipment, materials, facilities, or trained personnel that are not available at the location.

## **2. HOW TO USE THIS MANUAL**

### **Overview**

Each section begins with overview of topics discussed in it.

### **References**

The references listed in each section, shows the specific aspect of repair station operations discussed in it.

### **Requirements**

The requirements stated in the references are summarized.

## **3. TYPOGRAPHIC CONVENTION**

### **Change bars**

Vertical change bars are used to indicate material that has changed since the previous version of the manual. A change bar only indicates a change from the immediately preceding version of the manual.

#### **4. RSM ORGANIZATION**

The RSM contents consist of four main Sections as follow:

1. Table of Contents
2. General
3. Organization
4. Operations

#### **5. RECORD OF REVISION**

##### **Overview**

This section describes procedures for the announcement of revisions executed in this manual.

##### **References**

145.207(e) and AC 145-9, Chapter 2

##### **Requirements**

The Repair Station Manual (RSM) must contain procedures for revising the manual and notifying the Certificate Holding Office (CHDO) of revisions.

##### **Revisions Procedures**

This manual is distributed in hard-copy. When you receive a new revision of this manual containing the corresponding amended pages accepted by FAA:

1. Sign the Revision Receipt Acknowledgement (CEMEFA Form #01), accepting the new hard-copy, and acknowledging that previous version of

the RSM has been updated in the corresponding pages and no longer to be used.

2. Proceed to exchange the affected pages.
3. Ensure that the Record of Revision : CEMEFA FORM #21, List of Changes, CEMEFA FORM # 22 and List of Effective Pages: CEMEFA FORM #23 reflect the changes executed in accordance with the new revision.
4. Return the changed pages that are no more in use and had been replaced by the new revision, to the Quality Control Manager for proper disposal.

### **Record of Revisions**

Once accepted by the CHDO each manual holder, will be provided with the new revision along with Revision Receipt Acknowledgement Form (CEMEFA Form #01) to be signed and returned to the CEMEFA`s Manager. This Form, once signed, reflects acknowledgement of receipt by each manual holder.

<b>RECORD OF REVISION</b>			
<b>REVISION NUMBER</b>	<b>REVISION DATE</b>	<b>REVISION INSERTED</b>	<b>INSERTED BY</b>
IR	17-April -2006	17-April -2006	L. TORRES G.
1	09-November-2006	09-November-2006	L. TORRES G.

CEMEFA FORM #21

<b>LIST OF CHANGES</b>			
<b>REVISION NUMBER</b>	<b>NEW SECTION</b>	<b>CHANGED SECTION</b>	<b>DELETED SECTION</b>
1		Sec. 1.1, page 1	
1		Sec. 2.4, page 13	
1		Sec. 2.7, page 20	
1		Sec. 2.7, page 22	
1		Sec. 2.7, page 25	
1		Sec. 3.1, page 2	
1		Sec. 3.1, page 3	
1		Sec. 3.1, page 4	

CEMEFA FORM #22

## 6. GLOSSARY

### Terminology

AC	Advisory Circular.
AD	Airworthiness Directive.
Acceptable	Data is acceptable when it meets the requirements of the applicable regulations.
Accountable Manager	Means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA.
Alteration	Please refer to major and minor alteration
Approved	Approved by the Administrator unless used with reference to another person. Approval is granted to a repair station when the information, such as a process specification or rating, is listed on the operations specifications (OpSpecs).
Article	Means an aircraft, airframe, aircraft engine, propeller, appliance, or component part.
BER	Beyond Economical Repair.
CAR	Corrective Action Requested.
CBI	Computer Based Instruction.
CHDO	Means FAA certificate-holding district office. Our FAA office that has jurisdiction over us is Miami International Field Office (CHDO).
Chief Inspector	Leading Shift Inspector.
Class Ratings	Ratings issued if the repair station can prove the capability to maintain a representative number of products under this ratings. A class rating should not be issued and then restricted to a specific product. For such a case, a limited rating should be issued.
Contracting	Entering into an agreement between two or more persons for the performance of maintenance functions on an article.
Correction	An action taken to eliminate a detected nonconformity. For repair

	stations electing to use an International Organization for Standardization (ISO 9000) quality system, a correction may involve repair or rework and may be made in conjunction with a corrective action.
Corrective Action	An action taken to eliminate the cause of a detected nonconformity or other undesirable condition to prevent its reoccurrence. For repair stations electing to use an ISO 9000 or similar system, the undesirable condition may include potential regulatory violations, which differs from a nonconformity requiring correction.
Directly in Charge	Responsible for the work of a certificated repair station that performs maintenance, preventive maintenance, alterations, or other functions affecting aircraft airworthiness. A person directly in charge doesn't need to physically observe and direct each worker constantly, but must be available for consultation on matters requiring instruction or decision from higher authority.
EASA	European Aviation Safety Agency.
ESD	Electro Static Device.
Foreign Repair Station	A term used in the automated OpSpecs to describe an FAA-certificated facility located outside the United States that performs maintenance, preventive maintenance, or alterations on articles.
Inspector	A person fully qualified to be thoroughly familiar with regulations, methods, techniques, practices, aids, equipment and tools used to determine airworthiness of an article.
Limited Ratings	Ratings issued to Repair Station for the performance or maintenance on particular makes and models of airframes, powerplants, propellers, radios, instruments, accessories and/or parts.
Limited Specialized Service Ratings	Ratings issued for a special maintenance function when the function is performed in accordance with a specification or data acceptable to the FAA. The OpSpecs must include the specifications or data used by the repair station to perform that service in accordance with Part 145.61(c).
Line Maintenance	(1) Any unscheduled maintenance resulting from unforeseen events; or (2) Scheduled checks that contain servicing and/or inspections that do not require specialized training, equipment, or facilities.
Maintenance	Inspection, overhaul, repair, preservation, and the replacement of parts, excluding preventive maintenance.

Maintenance Function	A step, or series of steps, in the process of performing maintenance, preventive maintenance, or alterations, which results, or may result, in approving an article for return to service. Only persons authorized under Part 145.147(a) and 145.213(d) may approve an article for return to service, perform a final inspection, or sign a maintenance release.
Major Alteration	An alteration not listed in the aircraft, aircraft engine or propeller specifications: <ul style="list-style-type: none"> <li>(1) That may appreciably affect weight, balance, structural strength, performance, powerplant operations, flight characteristics, or other qualities affecting airworthiness; or</li> <li>(2) That is not done according to accepted practices or can't be done by elementary operations</li> </ul>
Minor Alteration	An alteration other than a major alteration.
Major repair	A repair that: <ul style="list-style-type: none"> <li>(1) If improperly done, might appreciably affect weight, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness; or,</li> <li>(2) Is not done according to accepted practices or cannot be done by elementary operations.</li> </ul>
Minor repair	A repair other than a major repair.
MT&E	Measuring Tool and Equipment.
OEM	Original Equipment Manufacturer.
OJT	On the Job Training.
Operations Specifications (OpSpecs)	The official document that describes the authorizations, ratings, and limitations of the repair station.
Preventive action	An action taken to eliminate the cause of a potential nonconformity or other potentially undesirable situation.
Preventive Maintenance	Simple or minor preservation operations and the replacement of small standard parts not involving complex assembly operations.
Procedure	A specified way to perform an activity or a series of steps, such as a procedure that describes the methods, steps, or means to carry out policy.
Quality	A manual that describes the inspection and quality control procedures

Control Manual (QCM)	used by the repair station.
Rating	A statement that, as a part of the repair station's certificate, describes the special conditions, privileges, or limitations issued under part 145, sections 145.59 and/or 145.61.
Repair Station Manual (RSM)	A manual that describes the procedures and policies of a repair station's operations.
Required Inspection Item. (RII)	An item of maintenance that, if not performed properly, or if improper part or materials are used, could result in a failure, malfunction, or defect, endangering the safe operation of the aircraft. An RII must be inspected by a trained, qualified, and authorized inspectors. The inspector must be listed on the repair station's roster but can't be the same individual who performed the work.
RTB	Ready to Build.
Supervisor	A person who directs the work performed under the repair station's certificate and OpSpecs.
TCDS	Type Certificate Data Sheets.

## 7. DOCUMENT CONTROL

### Overview

This Section describes how the CEMEFA Repair Station Manual (RSM) will be controlled and revised.

### References

145.207 (b), 145.207 (e), and 145.209 (k)

### Requirements

The RSM must contain procedures to control the original submission of the manual and subsequent revisions, including procedures for recalling revisions found to be not



acceptable by the FAA. The procedures must also describe the internal process for approving manual and procedure revisions.

The manual must contain procedures for distributing revisions and for notifying the Certificate Holding District Office (CHDO) of them. All persons issued a manual must receive manual revisions.

## 8. IDENTIFICATION AND CONTROL

The CEMEFA RSM is published with a discrete part number that incorporates the repair station Air Agency Certificate number.

Version numbers	The certificate number, manual number, manual holder, revision and publication date appear on the outside cover. Title certificate number, section and page number appear on each page.
Page numbers	Each section and the pages within sections are sequentially numbered to allow replacement of individual pages without reprinting the entire document.
Record of Revisions	Revision procedures are described in the “Record of Revisions” section. This section contains a “Record of Revisions”, Table 2.1.
Table of Contents	This manual has a Table of Contents that lists each section and its location in the manual.
List of Changes	The general organization of this manual is shown in “RSM organization”. The list of changes is shown in “List of Changes”, Table 2.2.
Change bars	Within each chapter, changes are made by a margin vertical change bar to indicate the revised portion of text.

## 9. INITIAL DISTRIBUTION

Initial distribution of the RSM will be in accordance with the “Master Distribution List” provided by CEMEFA, in accordance with Table 2.4. The Manual may be mailed with return receipt requested, or hand delivered with a signed receipt, Revision Receipt Acknowledgement (CEMEFA Form #01).

Table 2.4. Master Distribution List

MANUAL No.	MANUAL HOLDER	LOCATION	HARD-COPY	CD
1	Master	Library	1	2
2	CHDO	FAA-Miami	1	1
3	Quality Assurance Director	QAD Office	1	1
4	Accountable Manager	AM Office	1	1
5	CEMEFA’s Manager	Manager Office	1	1
6	Quality Control Dpt. Manager	QC Dpt. Office	1	1
7	Production Control Dpt. Manager	PC Dpt. Office	1	1
8	COM/NAV Area Supervisor	COM/NAV Area	1	1
9	ELEC/INST Area Supervisor	ELEC/INST Area	1	1
10	Parts and Spare Manager	Stockroom	1	1
11	Sign Out Copy	Library	1	N/A
12	Sign Out Copy	Library	1	N/A

## 10. REVISIONS

All manual holders and employees in general are advised to make change recommendations directing CEMEFA Form #02: Manual Change Recommendation to the Quality Control Department. All recommendations will be reviewed by the Quality Control Department Manager for necessity, applicability, content, and regulatory compliance.

Change procedures	<p>Once all changes notices have been reviewed, the Quality Control Department Manager will:</p> <ol style="list-style-type: none"> <li>1. Compile all changes into a draft revision to be reviewed by the CEMEFA's Manager.</li> <li>2. Make changes, if any, as specified by the CEMEFA's Manager.</li> <li>3. Update the Record of Revisions to reflect the new revision.</li> <li>4. Update the List of Effective Pages to reflect the new revision.</li> <li>5. Update the List of Changes Table to reflect the new revision.</li> <li>6. Submit these changes to the Quality Assurance Director for acceptance of the applied changes.</li> </ol> <p>Once the above process has been completed, the Accountable Manager will signify approval of the revision by signing the List of Effective Pages. The new revision will be routed to the CHDO as specified in "CHDO Notification".</p>
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**Revisions Distribution**

Once the change procedures has been completed and signed by the Accountable Manager, and accepted by the CHDO, the Quality Control Department Manager, will be responsible for the distribution of all the pages affected by of the new revision to all the Manual Holders, according to the Master Distribution List and with signed receipt Revision Receipt Acknowledgement (CEMEFA Form #01).

**CHDO Notification**

Within seven business (7) days after the revision acceptance, the Accountable Manager will hand deliver the new revision to the assigned PAI at the CHDO-Miami. In the event hand delivery is not possible, the revision will be delivered via certified mail or email. The PAI will sign the Revision Receipt Acknowledgement (CEMEFA Form #01), and return it to the Quality Assurance Director.

## **Correction Procedures**

If an administrative or maintenance action is performed under a revision found to be unacceptable to the FAA, the following procedure will be observed:

- The Quality Assurance Director in coordination with the Quality Control Department Manager will make the necessary corrections to that revision pursuant to the recommendations of the FAA.
  
- The Quality Assurance Director in conjunction with the Accountable Manager, will institute a recall of any and all articles serviced under the unacceptable revision so as to correct the procedure or to perform maintenance in accordance with the acceptable to the FAA.

## **11. ORGANIZATION AND MANAGEMENT**

This Section describes the CEMEFA Repair Station organization and management. It includes an organization chart, and identifies all positions and responsibilities.

### **References**

145.151, 145.153, 145.155, 145.157, 145.161, 145.209 (a), and 145.211

### **Requirements**

The RSM must identify only by title each management, supervisory and inspection personnel position with authority to act on behalf of the certificated repair station. The RSM must describe the duties, responsibilities, delegation and continuity of each

management position. CEMEFA must ensure that the duties and responsibilities are appropriate and that the positions exist within the repair station.

### Structure Description

The current organization allows proper communication and coordination between the various departments; flexibility to tune in with clients' requirements, expeditious productive processes yielding high quality results.

CEMEFA Accountable Manager	Designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA.
CEMEFA Quality Assurance Director	Designated by the certificated repair station that is responsible for directing, planning and establishing inspection procedures for the repair station in compliance of the FAA specifications, FAR, manufacturers' specifications, technical orders and quality operational activities. Advised directly to the CEMEFA Accountable Manager on all the aspects related with the control and insurance of the quality that contributes to the correct development of the operations of the repair station. The nexus with the FAA as for all aspects related with the control and insurance of the quality.
CEMEFA Management	Responsible for the work of a certificated repair station that performs maintenance, preventive maintenance, alterations, or other functions affecting aircraft airworthiness.
Quality Control Department	This Department controls the quality of the whole productive process of the repair station, from the preliminary inspection, repair, inspection or checkup processes, up to the final inspection, when the equipment returns to the client's hands.  Likewise, it assures that the productive process is executed according to the norms settled down in the FAR, makers' technical documentation, and other documentation accepted by the FAA.  The Quality Control Department has the following sections: Inspection, and Technical Library.
Production Control	This Department is in continued contact with the clients and/or

Department	Operators. Receives all works and establishes priorities for execution, and in coordination with the pertinent Supervisor Area, instructs implementation of works. The Production Control Department is composed of the following sections: Maintenance, Analysis Production and Parts and Spares.
Training Department	This Department is responsible for identifying, planning, developing and implementing the technical training required by the repair station personnel according to the ratings held and any other identified requirements.
COM/NAV Area	Executes the work required on Communications and Navigation components entering the repair station, according to its ratings, established procedures and current regulations.
ELEC/INST Area	Executes the work required on Electrical and Instruments components entering the repair station, according to its ratings, established procedures and current regulations.
Analysis Production	Provides information on production statistics to cooperate with the decision making level, advice on market tendency, possible new ratings and training required.
Inspection	Ensures the compliance of Quality Control policies and procedures in all and every step of the production process.
Technical Library	The Technical Library will maintain available current technical data for maintenance execution according to repair station capabilities and all the required documentation provided by the recordkeeping policies.

## 12. DUTIES AND RESPONSIBILITIES

This section itemizes the duties and responsibilities for the internal CEMEFA management positions:

### **CEMEFA's Manager**

Responsibility	CEMEFA's Manager is responsible for all technical services provided and offered to clients by Repair Station; including, but is not limited to facilities, infrastructure, personnel, equipment and materials. Responds for the Repair Station operation to the CEMEFA Accountable Manager.
Duties	1. Ensure that the repair station personnel follow applicable regulations.

	<ol style="list-style-type: none"> <li>2. Ensure that the repair station personnel follow the policies and procedures as described in the CEMEFA RSM and QCM.</li> <li>3. Provide adequate training, equipment, materials, and competent personnel pursuant to the operations of the repair station in order that it may comply with applicable FARS, manufacturer's requirements, and customer requests.</li> <li>4. Ensure adequate fire-fighting equipment is available at the repair station and operational.</li> <li>5. Ensure adequate safety precautions are in place and observed by repair station personnel.</li> <li>6. Ensure that the periodic drills are conducted for the purposes of indoctrinating personnel in the location and proper use of fire fighting equipment as well as performing periodic inspections for serviceability and adequacy.</li> <li>7. Establish liaison with air carriers with respect to applicable FARS when work for air carriers is to be performed.</li> <li>8. Work with the Quality Control Department Manager to evaluate articles for addition to or deletion from the capabilities list.</li> <li>9. Will sign the appropriate section of the Capability List Addition/Deletion Form (CEMFA Form #03).</li> <li>10. Ensure that completed work order files are maintained, in a secure, protected, and readily accessible manner, for a period of no less than two (2) years.</li> <li>11. Ensure that a sufficient number of supervisors are available to direct the work performed under the repair station certificate.</li> <li>12. Establish the criteria for hiring personnel for positions responsible for maintaining, supervising, or inspecting maintenance or alterations of civil aviation articles.</li> <li>13. Ensure that personnel are trained and informed of the procedures for inspecting articles for maintenance and material.</li> <li>14. Ensure that duty time limitations are observed.</li> <li>15. Will keep the complete file of "Record of Revisions"</li> </ol>
Delegation	The CEMEFA's Manager may delegate any and all of his duties to other qualified individuals within the company. However, this delegation does not relieve the CEMEFA's Manager of the ultimate responsibility for these duties.
Continuity	In absence of the CEMEFA's Manager the Production Control Department Manager will assume all duties and responsibilities as assigned and stated above. The CEMEFA's Manager may also delegate as deemed necessary, but does still has ultimate responsibility for these duties.

## Quality Control Department Manager

Responsibility	The Quality Control Department Manager is responsible to the CEMEFA's Manager for directing, planning and establishing inspection procedures for the repair station in compliance with the FAR, manufacturers' specifications, technical orders and quality operational activities. Has final authority for releasing the aircraft and parts.
Duties	<ol style="list-style-type: none"> <li>1. To provide the necessary documentation and reports in order to present them at time of inspection or at any other time to the CHDO Inspector. These documents shall include, but are not limited to, work order packages, purchase orders, training records, and calibration records.</li> <li>2. Supervise inspection personnel.</li> <li>3. Work with the CEMEFA's Manager establishing standards to ascertain that adequate safety precautions are observed.</li> <li>4. Maintain the RSM, QCM, and Forms Manual current at all the time.</li> <li>5. Ensure that procedures are in place to obtain information with respect to pertinent FAR requirements, Type Certificate Data Sheets (TCDS), and Airworthiness Directives (AD).</li> <li>6. Maintain the Receiving Inspection policies and procedures.</li> <li>7. Work with the CEMEFA's Manager to maintain the repair station's record keeping system.</li> <li>8. Maintain the calibration policy and procedures as delineated in the RSM and QCM.</li> <li>9. Ensure that records of calibration are maintained current.</li> <li>10. Ensure that procedures for shelf life are adequate and maintained current.</li> <li>11. Maintain corrective actions policy and procedures as delineated in the RSM and QCM.</li> <li>12. Assist, supervise, and direct personnel in the inspection procedures of the repair station, as directed by the CEMEFA's Manager.</li> <li>13. Submit reports of serious defects or recurring un-airworthy conditions in accordance with the policy and procedures as delineated in the RSM and QCM.</li> <li>14. Ensure that the maintenance performed for Air Carriers under parts 121, 125, 129, and 135 is done so in accordance with the carrier's program and maintenance manual as per 145.205.</li> <li>15. Coordinate with Quality Assurance Director the submission FAA Form 8610-2, Airman Certificate and/or Rating Change to the CHDO as necessary.</li> <li>16. Ensure that the policies of hazardous materials control are met in accordance with the QCM.</li> <li>17. Ensure the overall implementation and management of the shelf life program as stated in the Shelf Life Program of the QCM.</li> </ol>



Delegation	The Quality Control Department Manager may delegate any and all of this duties to other qualified individuals within the company. However, this delegation does not relieve the Quality Control Department Manager of the ultimate responsibility for these duties.
Continuity	In the absence of the Quality Control Department Manager, the most experience Avionics Inspector will assume all duties and responsibilities as assigned and stated above.

### **Production Control Department Manager**

Responsibility	The Production Control Manager is responsible to CEMEFA's Manager. (planning, control, organization and implementation of production activities.)
Duties	<ol style="list-style-type: none"> <li>1. Will train and assist assigned personnel in following the policies and procedures as delineated in the RSM and QCM.</li> <li>2. With the assistance of the Quality Control Department Manager, train technicians in the proper work procedures to follow, to include use of dimensional devices, and the procedure for signing out manuals.</li> <li>3. Assure training of the new technicians on the proper safety precautions relevant to the job function performing.</li> <li>4. Assure the correct maintenance of the repair station's special tools and equipment in serviceable and working condition.</li> <li>5. Supervise the premises of their respective shop and other assigned areas in a clean and orderly manner.</li> <li>6. Plan, direct and coordinate work activities within the shop, and the planning of its activities in conjunction with other department as required.</li> <li>7. Ensure the technicians in their respective shops perform safe, efficient and quality maintenance.</li> <li>8. Ensure the accuracy and quality of all work performed within their respective shops.</li> <li>9. Ensure the proper handling of all parts while being processed through the maintenance function.</li> <li>10. Ensure the proper tagging and identification of parts and components as delineated in the RSM and QCM.</li> <li>11. Ensure that assigned personnel have in their possession and follow the appropriate technical data during the performance of any maintenance function.</li> <li>12. Ensure that preliminary, hidden damage, in-process inspections are thoroughly and correctly annotated on the appropriate forms.</li> <li>13. Ensure, that prior to performing work, all assigned personnel are appropriately qualified and trained for the task.</li> <li>14. Ensure that customer requirements are understood and followed by assigned personnel.</li> </ol>

Delegation	The Production Control Department Manager may delegate any and all of this duties to other qualified individuals within the company. However, this delegation does not relieve the Production Control Department Manager of the ultimate responsibility for these duties.
Continuity	In the absence of the Production Control Department Manager, the lead Area Supervisor will assume all duties and responsibilities as assigned and stated above.

### **Avionics Inspector (COM/NAV and/or ELEC/INST)**

Responsibility	The Avionics Inspector (Com/Nav and/or Elec/Inst) is accountable to the Quality Control Department Manager for the quality of the work, in the sense that RSM requirements and FAR requirements are met.
Duties	<ol style="list-style-type: none"> <li>1. Perform a follow-up with the laboratory whilst the equipment is being serviced.</li> <li>2. Perform a final inspection of the repaired equipment and prepare release cards.</li> <li>3. Control that all works are performed according to the technical manufacturer's manuals and the FAA regulations.</li> <li>4. Strictly comply with the inspection policies provided in the QCM.</li> <li>5. Keep updated on FAR, technical manuals, etc.</li> </ol>
Delegation	The Avionics Inspector, with the prior approval of the Quality Control Department Manager, may delegate any and all of his duties to other qualified individuals within the company. However, this delegation does not relieve of the ultimate responsibility for these duties.
Continuity	In the absence of the Avionics Inspector, the Quality Control Department Manager will assume all duties and responsibilities as assigned and stated above.

### **Area Supervisors (COM/NAV and/or ELEC/INST)**

Responsibility	The Area Supervisors or Avionics Supervisors (Com/Nav and/or Elect/Inst) are responsible to the Production Control Department Manager for the planning, direction, control and implementation of repair station work orders, optimizing the use of human and material resources available, and guaranteeing safety of operations.
Duties	<ol style="list-style-type: none"> <li>1. Receive from the Production Control Department the works to be carried out.</li> </ol>

	<ol style="list-style-type: none"> <li>2. Plan the work of the members of staff placed under his charge on a daily basis.</li> <li>3. Coordinate, direct, and control that works are performed adhering to RSM.</li> <li>4. Ensure that cleanliness and orderliness are maintained in the working areas.</li> <li>5. Select, with due anticipation, the personnel, material, documentation and equipment required to perform extra work, as required.</li> <li>6. Ensure that all safety measures are duly ensured.</li> <li>7. In coordination with the Inspector, perform the work inspection in progress.</li> <li>8. Control the appropriate use of tools and gauging equipment.</li> </ol>
Delegation	The Supervisors Area, with the prior approval of the Production Control Department Manager, may delegate any and all of his duties to other qualified individuals within the company. However, this delegation does not relieve of the ultimate responsibility for these duties.
Continuity	In the absence of the Supervisors Area, the lead technician will assume all duties and responsibilities as assigned and stated above.

#### **Avionics Technicians (COM/NAV and/or ELEC/INST)**

Responsibility	Implements work orders and is held accountable with the Area Supervisor.
Duties	<ol style="list-style-type: none"> <li>1. Keep updated with FAR regulations, handling of maintenance manuals and RSM.</li> <li>2. Maintain the work area clean and in order.</li> <li>3. Observe all safety measures in the work areas.</li> <li>4. Use updated technical manuals during the repair and servicing of equipment.</li> <li>5. Coordinate provision of spare parts with the Supervisor.</li> <li>6. Fill out and sign cards and forms concerning the condition of equipment.</li> <li>7. Use testing equipment, tools and harnesses appropriately, according to the requirements of the technical order.</li> </ol>
Delegation	The Avionics Technicians, with the prior approval of the Production Control Department Manager, may delegate any and all of his duties to other qualified individuals within the company. However, this delegation does not relieve of the ultimate responsibility for these duties.
Continuity	In the absence of the Avionics Technicians, any another Avionics Technicians will assume all duties and responsibilities as assigned and stated above.

## Parts and Spares Technician

Responsibility	The Parts and spare Technician is responsible to the Production Control Department Manager for and has authority over the operation of the Stockroom and the Shipping & Receiving functions of the repair station. This is to include, but is not limited to, personnel, equipment, and materials.
Duties	<ol style="list-style-type: none"> <li>1. Execute specific shelf life requirements.</li> <li>2. Ensure the preservation and storage of all materials, parts and supplies in a condition enabling them to be installed or used on civil aviation articles.</li> <li>3. Control and correlate the inventory on an annual basis.</li> <li>4. Weekly Control of the Material Shelf Life List (CEMEFA Form #30)</li> <li>5. Ensuring that inventory accuracy is maintained.</li> <li>6. Responsible for overall control of the repair station inventory as well as the updating of the inventory database.</li> <li>7. Ensure that all materials released to the shops are current with respect to shelf life and cure dates.</li> <li>8. Ensuring that the correct parts are issued to the appropriate work orders as the parts arrive.</li> <li>9. Ensure security for and control of all test equipment maintained in the stock room.</li> <li>10. Receiving and processing all sub-components entering the repair station from either a vendor or an outside, subcontracted, maintenance facility.</li> <li>11. Ensuring that all hazardous materials requirements are met when necessary.</li> <li>12. Perform the incoming review to identify, control, segregate, and maintain all materials (including raw materials and parts).</li> <li>13. Ensure that purchase orders and trace documentation is complete and accurate.</li> <li>14. Coordinate with the Quality Control Department Manager the execution of the policies of hazardous materials control in accordance with the QCM.</li> <li>15. Ensure that the Shelf Life Program is followed and material is identified and labeled accordingly as stated in the corresponding section of the QCM.</li> </ol>
Delegation	The Parts and spare Technician, with the prior approval of the Quality Control Department Manager, may delegate any and all of his duties to other qualified individuals within the company. However, this delegation does not relieve of the ultimate responsibility for these duties.
Continuity	In the absence of the Parts and spare Technician, Designated Inspector will assume responsibility for these duties and may delegate as deemed necessary all assigned duties to other duly qualified personnel within the repair station.

## Tech Data Librarian

Responsibility	<p>The Tech Data Librarian is responsible to the Quality Control Department Manager for and has authority over the operation of the Technical Library. This include, but is not limited to:</p> <ul style="list-style-type: none"> <li>• OEM Manuals.</li> <li>• Customer supplied manuals.</li> <li>• Test equipment manuals.</li> </ul>
Duties	<ol style="list-style-type: none"> <li>1. Reviewing for currency all manuals and other tech data that is maintained in the Technical Library prior to the manual being issued to a Technician.</li> <li>2. Update as needed the technical data computer database.</li> <li>3. Ensure that all revisions are annotated in the manual either on the record of revisions page or the manual control chart.</li> <li>4. Ensure the manufacturer's Index of Publications is maintained current at all time.</li> <li>5. Distribute any technical information, documents or data received through the stock room.</li> <li>6. Ensure that all work orders are opened correctly and efficiently.</li> </ol>
Delegation	<p>The Tech Data Librarian, with the prior approval of the Quality Control Department Manager, may delegate any and all of his duties to other qualified individuals within the company. However, this delegation does not relieve the Librarian of the ultimate responsibility for these duties.</p>
Continuity	<p>In absence of the Tech Data Librarian, the Inspector will assume responsibility for these duties and may delegate as deemed necessary all assigned duties to other duly qualified personnel within the repair station.</p>

## Training Officer

Responsibility	<p>The Training Officer is responsible to the CEMEFA's Manager for maintaining the proper training and skills-building records, development and implementation of the Training program.</p>
Duties	<ol style="list-style-type: none"> <li>1. Present training requirements for the Center's personnel.</li> <li>2. Coordinate with Quality Control Department Manager completion of the annual training schedule in reference with Training Manual.</li> <li>3. Maintain records and training control for all personnel.</li> <li>4. Organize all technical courses to be carried out at repair station for the personnel.</li> <li>5. Become thoroughly familiar with the contents of repair station Training Manual, in order to comply with and assist the Quality Control Department Manager in all training events.</li> </ol>

Delegation	The Training Officer may delegate any and all of his duties to other qualified individuals within the company. However, this delegation does not relieve the Librarian of the ultimate responsibility for these duties.
Continuity	In absence of the Training Officer, the Technical Librarian will assume responsibility for these duties and may delegate as deemed necessary all assigned duties to other duly qualified personnel within the repair station.

### **13. PERSONNEL**

#### **Overview**

This Section describes the CEMEFA personnel management functions. The CEMEFA personnel roster will provide a complete picture of CEMEFA staffing.

#### **References**

145.151, 145.153, 145.155, 145.157, 145.161 & 145.209 (b).

#### **Requirements**

The repair station must maintain a current personnel roster as required by 145.161. The rosters must be accessible for review and inspection by the FAA. The rosters must identify the names of all: Management personnel, Supervisory personnel, Inspection personnel, and Personnel authorized to sign an approval to return to service for a maintained or altered component.

#### **Personnel Rosters and Employment Summaries**

Personnel rosters and employment summaries are located in the CEMEFA Quality Control Office. They are available for review and inspection by FAA personnel.

Responsibility	<p>The Quality Control Department Manager is responsible for maintain the CEMEFA personnel rosters. This includes:</p> <ul style="list-style-type: none"> <li>• Developing the personnel rosters.</li> <li>• Revising the personnel rosters.</li> <li>• Keeping the personnel rosters current.</li> <li>• Advising CEMEFA of revisions to the personnel rosters.</li> <li>• Maintaining an employment summary of each individual employment by the repair station.</li> </ul>
Roster and Authority of Authorized Supervisory and Inspection Personnel	<p>CEMEFA will maintain a roster of all supervisory and inspection personnel in a format acceptable to the FAA. As required by FAA 145.161, the rosters includes the following:</p> <ol style="list-style-type: none"> <li>1. The names of the repair station officials who are responsible for its management.</li> <li>2. The names of the supervisors that oversee the maintenance function.</li> <li>3. The names and authorization of assigned inspection personnel.</li> <li>4. The names of the individuals authorized to sign the FAA Form 8130-3 Airworthiness Approval Tag.</li> </ol>
Roster Records	<p>CEMEFA maintains a current employment summary for all managerial, supervisory and inspection personnel that appear on the repair station roster. Each employment summary reflects the following information:</p> <ol style="list-style-type: none"> <li>1. Present title.</li> <li>2. Total years of experience and type of maintenance work performed.</li> <li>3. Past relevant employment including name of previous employer and length of employment by month and year.</li> <li>4. Scope of present employment.</li> <li>5. Type of mechanic or repairman certificate held and the ratings on that certificate.</li> </ol>
Repair Station Roster	<ol style="list-style-type: none"> <li>1. The Quality Control Department Manager will complete the repair station roster for management, supervisory, and inspection personnel by entering the following information: <ol style="list-style-type: none"> <li>a. Name and Title.</li> <li>b. Certificate and Number (N/A if not applicable).</li> <li>c. Personnel qualifications for receiving, preliminary, hidden damage, in process, final and approval for return to service inspections.</li> <li>d. The individual will sign and initial in the space provided.</li> <li>e. Affix a facsimile of the assigned inspector stamp as applicable.</li> </ol> </li> <li>2. Prior to begging placed on the roster a new manager, supervisor, or inspector must provide a record of experience to determine qualifications for the potential assignment.</li> </ol>

	<ol style="list-style-type: none"> <li>3. Ensure that each individual authorized to approve articles for return to service (sign the FAA Form 8130-3) is qualified for certification under FAR 65.</li> <li>4. Submit a FAA Form 8610-2 (latest version) for additional repairman certificates, if necessary. Eligibility requirements will be followed as addressed in FAR 65.101.</li> <li>5. Submit a letter of recommendation stating that the individual meets the requirements of FAR 145.159.</li> <li>6. The Quality Assurance Director will notify the FAA, within five (5) business days, of any changes to the roster.</li> </ol>
<p>Employment Summaries</p>	<p>As specified in FAR 145.161(4) and addressed in Roster Records above, CEMEFA maintains a summary of employment for each individual on the repair station roster. The Quality Control Department Manager will maintain these summaries current at all times.</p> <p>If there is a change in any of the following information the summary must be revised to reflect the change.</p> <ol style="list-style-type: none"> <li>a. The title of the individual.</li> <li>b. The scope of employment.</li> <li>c. The certificate type or ratings.</li> <li>d. Total years experience.</li> </ol> <p>The Quality Control Department Manager is responsible to ensure that the appropriate changes are accomplished.</p>

#### **14. DESCRIPTION OF OPERATIONS**

This Section provides a description of the CEMEFA Operations, a general Work Flow show the Repair Station operations. Also, this Section provides a general description of the repair station housing, facilities, equipment, and materials.

#### **References**

145.101, 145.103, 145.105, 145.109, & 145.209(c).

#### **Requirements**

This section should include a description of repair station Work Flow, housing and facilities, and a drawing showing the floor layout of the facilities.



## **General Work Flow**

The Parts and Spare Technician will execute Receiving Inspection of all articles received at the facility for maintenance and maintenance support, according to procedures detailed in CEMEFA Form #31: “Material Receiving Inspection Checklist” and corresponding Receiving Inspection Section of the Quality Control Manual. In incoming repairable equipment the corresponding section of CEMEFA Form #15: Repair / Overhaul Router (ROR) and Customer Special Instructions (CEMEFA Form #18) must be filled.

Once Receiving Inspection has been completed, and article is qualified for repair, the Parts and Spare Technician will generate, a Repairable (green) Tag (CEMEFA Form #28) and attach it with the equipment. The above stated documents (with exception CEMEFA Form #28) along with the customer's repair order (if applicable) will be forwarded to the Library for current manual and RS Capability verification. If the current manual and RS Capability verification fails, register this equipment and notify to Production Department for new capacity analysis.

Depending upon the nature of the incoming articles (support parts), the P&S technician will determine applicable shelf life policies according to CEMEFA Form #30: “Material Shelf Life List”, Electrostatic device care (use of antistatic wrist discharger and pads) and Hazardous Material determination and treatment according to procedures detailed in the corresponding section of the QCM.

Those received articles which fail to pass the receiving inspection and therefore are not qualified for repair or repair support will receive a Scrap/Reject (red) Tag (CEMEFA

Form#27) and placed in quarantine according to procedure established in the Quality Control Manual and use of CEMEFA Form #34: Quarantine Register, pending correction or customer directed disposition. Customer Service will be notified of the discrepancy and kept updated of the status.

For those SUP articles, procedures established in the corresponding section of the QCM, AC 21-29 and FAA Form 8120-11 will be observed. If information on the repairable articles is correct, the manual is available and current, and capabilities have been confirmed the Tech Data Librarian will enter the information in the system and fill the corresponding part of the CEMEFA Forms #15, #16, #18 and #31.

The data package will be returned to the Parts and Spare Technician for filling the corresponding information in the paperwork package, attach the data package to the article and notify to the Production Department. The Production Department Manager receive the data package, fills the Register Control, carries out the work delegation, deliver the data package and the article to the Hospital Incoming Shelf, and notify to the Area Supervisor.

The Area Supervisor receives the article and Data Package (#15, #16,#18, #28 & #31), fills the internal labs. Control, designates a Technician to the maintenance and sends data package to the Technician.

The Technicians receives data package (#15, #16,#18, #28 & #31), obtains applicable data from Tech Library and will perform a Preliminary Inspection of the article as delineated in the RSM & QCM as well as the OEM or customer supplied data, fills the

corresponding documents in the data package. If this inspection fails, the Area Supervisor will be notified and take the corrective action until this inspection pass.

Hidden damage inspections will be performed once the article has been opened. Fills the Article Eval. Report #32 (if applicable), take picture of the findings (if applicable), notifies to the Area Supervisor the parts and labor required to perform the work. Puts article and data package in Awaiting Approval Shelf. Fills the Material Requisition (CEMEFA Form #05), and deliver this to the Area Supervisor who will deliver to P&S to check availability in stock or quotation parts from available sources (Material quotation). This information and the labor required to perform will be delivered to Production Control Manager who notified the customer. If the customer accepts the work execution, the Area Supervisor notifies the Technicians the authorization to continue with the maintenance and Technicians puts the equipment in Awaiting Parts Shelf while the P&S purchase the material. The material will be delivered to the Area Supervisor and then to Technicians, while the equipment and data package will be located in Ready to Build Shelf (RTB).

A rejected quotation which, by customer request, renders the part Beyond Economical Repair (BER) will require the article to be returned to the customer or scrapped.

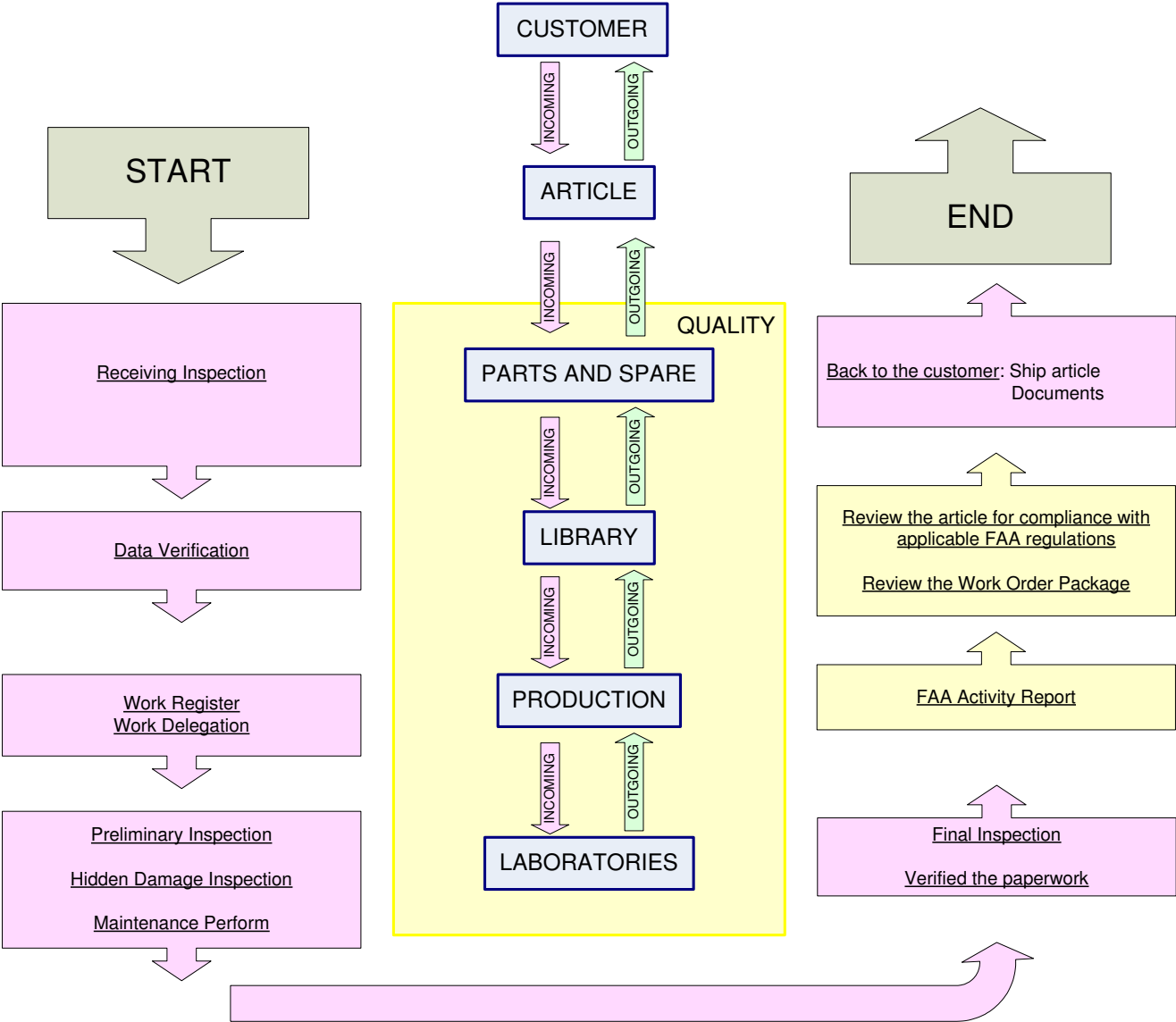
The Technicians continue with the maintenance and the In Process Inspection is executed. When the maintenance is finished by Technicians. The Area Supervisor, receives data package (#15, #16, #18, #28, #31 & #32 (if applicable)), ensures data package is complete, and ensures the Final Inspection. If the Final Inspection is correct, the Technicians finish maintenance work and close the article. Then the Area

Supervisor review the paper work (#15, #16, #18, #28, #31 & #32 (if applicable)) is complete. Fills these documents, puts equipment in Return To Service Shelf and sends data package to Quality Control Department who receive data package (#15, #16, #18, #31 & #32 (if applicable)), review data and article for FAA compliance and control. Remove Green Tag #28 from equipment, fills the computer Work Order (Form #16), notification and sends to Production Department the data package (#15, #16, #18, #31 & #32 (if applicable)), and 8130-3). If the In Process and Final Inspections aren't completed, the Area Supervisor will take the respective corrective actions. While the Hiding Damage Inspection fails, the Area Supervisor receives the data package (#15, #16, #18, #28, #31 & #32) and will be notified to Production Department who will coordinate with Customer Service notified to the Customer and the equipment will be sent to P&S to put the Red Tag # 27, send to Quarantine and awaiting customer instruction.

The Production Department receive data package (#15, #16, #18, #31 & #32 (if applicable), and 8130-3), fills FAA Activity Report (CEMEFA Form # 48), and prepare the Invoice. Send data package (#15, #16, #18, #31 & #32 (if applicable), and 8130-3), the equipment and the invoice to P&S for corresponding notification to the Customer.

The shipping personnel will inspect the data package against the article to ensure part and serial numbers match and that all signatures are affixed in the correct locations. The originals along with a copy of the invoice and shipping ticket will be placed in an envelope and shipped with the article back to the customer.

**CEMEFA Work Flow Chart**



## 15. HOUSING AND FACILITIES

General	In order to perform maintenance on articles listed on its approval capabilities lists, CEMEFA provides suitable housing for facilities, equipment, materials, and personnel consistent with its ratings. This repair station meets the requirements as expressed in FAR 145.103. A layout provided on the following pages.
Location	<p>The Electronics Maintenance Center (CEMEFA) Repair Station is located at Guayaquil, Ecuador.</p> <p style="text-align: center;">Av. de las Américas S/N, junto a la Aviación Naval, Aeropuerto Internacional José J. de Olmedo.</p>
Housing	<p>The CEMEFA repair station has an total area of 450 m2, distributed in the following areas:</p> <p>Offices</p> <ul style="list-style-type: none"> <li>▪ Management Office</li> <li>▪ Secretary's Office</li> <li>▪ Technical library</li> <li>▪ Classroom</li> <li>▪ Quality Control Department Office</li> <li>▪ Production Control Department Office</li> <li>▪ Engineering Department Office</li> <li>▪ Parts and Spare Warehouse</li> <li>▪ Finances Office</li> <li>▪ Clients reception</li> </ul> <p>Laboratories</p> <ul style="list-style-type: none"> <li>▪ Electrical and Instruments Laboratory</li> <li>▪ Com/Nav Laboratory</li> </ul> <p>The infrastructure comprising offices and laboratories are cement-built with asbestos roofing, with the following areas:</p> <ul style="list-style-type: none"> <li>▪ 241 m2 for the administrative area.</li> <li>▪ 100 m2 for the laboratories.</li> <li>▪ 58 m2 for classrooms and technical library.</li> <li>▪ 51 m2 for warehouse.</li> </ul>
Facilities	<p>All offices and laboratory areas have fluorescent ceiling lighting fixtures.</p> <p>Both laboratories have benches with the following electrical installations:</p> <ul style="list-style-type: none"> <li>▪ 110 VAC - 60 Hz</li> <li>▪ 26 VDC</li> </ul>

	<ul style="list-style-type: none"> <li>▪ 115 VAC - 400 Hz - 3 ph</li> <li>▪ 14 VDC</li> <li>▪ 28 VDC</li> </ul> <p>All of the benches have systems of air to pressure.</p> <p>Electrical and Instruments Laboratory possesses a system of purification of air by means of ultraviolet lamps and air ionizers.</p> <p>All the laboratories have air conditioning systems to control the temperature of each area.</p> <p>Instrument and COM/NAV Laboratories are equipped with suitable racks, trays and stands for storage of all articles, depending on its current status.</p> <p>The Laboratory has two doors: one that opens directly to the offices and the other to the hangar, which also constitutes the “Emergency Exit”.</p> <p>The ramp across the hangar is reinforced concrete and is provided with high-power reflectors.</p> <p>Fire suppression equipment is provided throughout the facility as well.</p>
Support Equipment	CEMEFA has the required electronic pieces of equipment (see 4.1.4. Equipment and Materials Section).to perform maintenance of capabilities listed components.
Tools	The inventory of tools is available at the warehouse (see 4.1.4. Equipment and Materials Section).

verification by initialing the step concerned. Also, a brief explanation of why the step is not applicable will be noted. Documents will be completed by the persons performing each work step described.

Completion of a work step will be indicated by the person performing the task entering his first initial, last name and date. Inspectors shall indicate the acceptance of the work or inspection performed by affixing their stamp or sign next to the task(s) on the work order package document as well as the date.

### **Recordkeeping**

The repair station will maintain all documents pertaining to a particular work order including a copy of the 8130.3 along with a copy of the final work order teardown. These documents as well as work performed by outside sources will be maintained on file for a period of two (2) years.

Only senior staff members and the Tech Data Librarian have access to the work order files once they are closed. All required records are available for inspection by the FAA. All such requests shall be coordinated with the CEMEFA's Manager. The forms used to record each of the following activities are contained in a CEMEFA's Forms Manual. CEMEFA's Forms Manual contains the actual document in use as well as a description of how the form must be completed. These forms, when completed for any work performed by the repair station shall cover such items as:

- Incoming inspection records and documents
- Maintenance planning records and references
- Engineering Orders



- Documentation of interim steps, particularly in-process inspections
- Records (tags) for parts
- Release documents
- FAA forms (e.g., Form 337, Form 8130-3, Form 8120-11, Form 8110-3).

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## ANNEXES

### ANNEX 1. TEST ABOUT FAR 145—REPAIR STATIONS

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

CHARGE: \_\_\_\_\_

The FAR 145 describes how to obtain a repair station certificate. Also contains the rules a certificated repair station must follow related to its performance of maintenance, preventive maintenance, or alterations of an aircraft. It also applies to any person who holds, or is required to hold, a repair station certificate issued under this part.

The following multiple choice test is intended to measure the general knowledge of the CEMEFA's personnel about the Federal Aviation Regulation - Part 145. It was designed by students of the Applied Linguistic Career of the Army Polytechnic School, like an instrument to develop their final project.

**INSTRUCTIONS:** Please circle the letter or letters that indicate(s) the correct answer(s).

- 1. Who is the responsible for all Repair Station operations that are conducted under part 145?**
  - a. The quality assurance manager
  - b. The inspector
  - c. The accountable manager
  
- 2. Which of the following statements is/are directly regarding with the definition of Line Maintenance?**
  - a. Any unscheduled maintenance resulting from unforeseen events; or
  - b. Scheduled checks that contain servicing and/or inspections that do not require specialized training, equipment, or facilities.
  - c. All the above
  
- 3. Which condition is necessary regarding the certificate and operations specifications issued to a certificated repair station?**
  - a. They must be available on the premises for inspection by the public and the FAA
  - b. They must be file in a format acceptable to the FAA in accordance with 145.219 Recordkeeping.
  - c. They must show rating, name of the repair station, emission date and renewal date, etc.
  
- 4. An application for a repair station certificate and rating must be made in a format acceptable to the FAA and must include the following:**
  - a. A roster with the names of management, all inspection personnel, supervisory personnel, and technicians.
  - b. An organizational chart of the repair station and the names and titles of managing and supervisory personnel.
  - c. The file documentation of the schedule self-evaluation.

- 5. Which statement is true regarding to the certificate issued to a repair station located outside the United States?**
  - a. A certificate or rating issued to a repair station is effective from the date of issue until the repair station surrenders it or the FAA suspends or revokes it.
  - b. A certificate or rating issued to a repair station is effective from the date of issue until the last day of the 12th month after the date of issue.
  - c. The certificate or rating may continue until 24 from the date of issue if the repair station has operated in compliance with the applicable requirements of part 145.
  
- 6. What task must be completed before a repair station certificate can be issued for a repair station that is located outside the United States?**
  - a. The applicant must show that the repair station certificate and/or rating will work in U.S.-registered aircraft
  - b. The applicant must show a statistical number of the foreign-registered aircraft that operated in the area.
  - c. The applicant shall certify in writing that all employees for the repair station, its contractors, or subcontractors performing a job function concerning the transport of dangerous goods (hazardous material) are trained.
  
- 7. Inside the requirements to obtain a FAA certificate, you must demonstrate:**
  - a. Appropriate equipment, Qualified personnel
  - b. Update technical data, Appropriate housing and facilities
  - c. All the above
  
- 8. The holder of an expired, surrendered, suspended, or revoked certificate must:**
  - a. Applies for a renewal
  - b. Return it to the FAA.
  - c. Send its request for renewal
  
- 9. The Part 145.59 (d) refers to radio ratings. Inside of it we find different classes, what Class 2 refers to?**
  - a. Communication Equipment
  - b. Navigational Equipment
  - c. Radar Equipment
  
- 10. The Part 145.59 (e) refers to instrument ratings. Inside of it we find different classes, what Class 2 refers to?**
  - a. Electrical
  - b. Gyroscopic
  - c. Mechanical
  
- 11. A certified repair station must ensure its supervisors, inspectors, and each person authorized to approve an article for return to service...**
  - a. Listens, speaks, reads, and writes English.
  - b. Understand, reads, and writes English.
  - c. Understand, and writes English.
  
- 12. The part 145.161 (a) explains that a certified repair station must maintain and make available a roster of all the personnel with the names and responsibilities. If this roster changes, how long must it reflect these changes?**
  - a. In five business day

- b. In ten business day
- c. In fifteen business day

**13. The roster of the repair station must be composed of:**

- a. The management, supervisory, inspection, and authorized to sign a maintenance release personnel.
- b. Each employment of the repair station with a summary that contain enough information on each individual in compliance with the FAA regulations.
- c. The management and supervisory personnel that includes the names of the repair station officials who are responsible for its management.

**14. A certified repair station located outside the United States must ensure that the personnel authorized to approve an article for return to service:**

- a. Has at least 2 years practical experience with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance.
- b. Be trained in or has 18 months practical experience with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance.
- c. Be certificated under Part 65-Certification: Airmen other than flight crewmembers.

**15. A certified repair station must retain the records of the articles that were approved for return to service**

- a. 18 months
- b. At least 18 months
- c. At least 2 years

**16. What must a training program ensure?**

- a. That each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task.
- b. That each employee assigned to the productive process be training according to the assigned task
- c. That the initial and recurrent training be according to the employee kind and the repair station performs its work according the FAA Regulations and quality control manual.

**17. The training records must be retained for:**

- a. 18 months
- b. a minimum of 2 years.
- c. At least 12 months

**18. May a certificated repair station arrange for another person to perform the maintenance of any article for which the certificated repair station is rated?**

- a. Yes, it may
- b. No, it may not.
- c. Any maintenance must be performed using the roster personnel in accordance with the applicable approved technical data or data acceptable to the FAA.

**19. Which of the listed requirements is NOT true regarded to work performed at another location?**

- a. The work is necessary due to a special circumstance, as determined by the FAA

- b. It is necessary to perform such work on a recurring basis, and the repair station's manual includes the procedures for accomplishing it.
  - c. The certificated repair station's operations specifications include an authorization to perform line maintenance.
- 20. The procedures for revising the training program required by 145.163 and submitting revisions to the certificate holding district office for approval must be included in:**
- a. The training manual.
  - b. The repair station manual.
  - c. The quality control manual.
- 21. A certificated repair station manual must include:**
- a. Procedures to govern work performed at another location in accordance with 145.203.
  - b. Procedures used for performing preliminary inspection of all articles that are maintained.
  - c. Procedures used for establishing and maintaining current technical data for maintaining articles.
- 22. Which statement(s) is/are true regarding quality control system?**
- a. Repair station personnel must follow the quality control system when performing maintenance under the repair station certificate.
  - b. A quality control system must include a description of the certificated repair station's operations, including the housing, facilities, equipment, and materials.
  - c. A certificated repair station must prepare and keep current a repair station manual in a format acceptable to the FAA
- 23. What is the language in which a certified repair station must retain the records?**
- a. The one spoken where the repair station is located
  - b. English
  - c. The language that the FAA inspector speaks.
- 24. When applying the sentence: "Only an employee certificated under part 65 is authorized to sign off on final inspections and maintenance releases for the repair station"?**
- a. It applies depending of the repair station capability list.
  - b. It applies for individuals employed by a repair station located outside the United States.
  - c. It applies when a repair station contracts maintenance with a noncertificated person.
- 25. How often the certificate holding district office will be notified of the capability list revision?**
- a. It depends of the approved procedure included in the repair station manual.
  - b. 3 months before the renew certificate.
  - c. It depends of the approved procedure included in the quality control manual.

- 26. Who remains directly in charge of the work performed by the noncertificated person?**
- The certificated repair station that contracted the maintenance.
  - The noncertificated person who developed the work.
  - The repair station quality control assurance
- 27. Does the repair station need a procedure to revise the training program?**
- Yes, each year the repair station must sent the holder district office the annual program.
  - Yes, the training program must be identified in the Repair Station and submitting revisions to the certificate holding district office for approval.
  - Yes, the training program must be revise according to AC 145-10: Repair Station Training Program
- 28. Which manual must include a description of the required records and the recordkeeping system used to obtain, store, and retrieve the required records?**
- The Quality Control Manual
  - The Repair Station Manual
  - The Training Manual
- 29. What must a certificated repair station do if any serious failure, malfunction, or defect article is discovered?**
- Reports to the FAA within 96 hours after discovers it
  - Verifies, test and/or inspect the article again until perform a satisfactory work.
  - Makes a report to its certificate holding district office within 96 hours after discovers it
- 30. The FAA inspections repair station that is located within and outside the United States will be developed:**
- Each year
  - Each two years
  - At any time

- THANK YOU -



## ANNEX 2. READING COMPREHENSION TEST

(5 parts – 30 questions)

### PART 1

**Instructions:** Read through the text, then answer the questions that follow. Circle the letter “T” if the statement is true or the letter “F” if the statement is false (5 points).

#### The Digital Divide

A recent survey has shown that the number of people in the United Kingdom who do not intend to get internet access has risen. These people, who are known as 'net refuseniks', make up 44% of UK households, or 11.2 million people in total.

The research also showed that more than 70 percent of these people said that they were not interested in getting connected to the internet. This number has risen from just over 50% in 2005, with most giving lack of computer skills as a reason for not getting internet access, though some also said it was because of the cost.

#### Questions:

1 - More people in the UK do not intend to get internet access than before.

T F

2 - The majority of people in the UK are 'net refuseniks'.

T F

3 - Most of those without internet access want to get it.

T F

4 - The minority of the people surveyed in 2005 weren't interested in having internet access.

T F

5 - The main reason for not getting internet access is the cost.

T F

### PART 2

**Instructions:** Read the passage, and then answer the questions. Circle the BEST answer a, b, c or d in the test which you consider correct (5 points).

#### Television

Everyone loves television – or do they? As channels proliferate and programs multiply like rabbits, it seems that more and more people are turning off their television because they “would rather be out doing something.” The reason for this mass turn-off seems to be the quality – or lack of quality – of the programming. Many people complain that most television programs are boring, tediously violent or just plain silly. Even those who have cable television, which gives access to 200 channels or more, are becoming disillusioned with what is on offer. Any alternative, it would seem, is better than being subjected to non-stop pop music and endless advertising, or sitting through some mediocre program or film which provides about as much entertainment as watching paint dry. One of the problems with TV watching is that it is completely sedentary. How long can anyone sit in front of

the tube before they begin to fidget and squirm? Today's "body-beautiful" culture is another influencing factor. Who can afford to sit vegetating on the couch while their body-conscious friends are working on their biceps in the gym, jogging or having a game of tennis with their colleagues? Maybe the couch potato is a dying breed after all.

**Questions:**

1. According to the passage, television...
  - a. is increasingly popular.
  - b. has more and more channels.
  - c. is increasingly violent.
  - d. gets better and better.
  
2. It seems that many people...
  - a. would rather do anything that watch TV.
  - b. would rather watch TV than do anything else.
  - c. prefer TV to sport and other activities.
  - d. like to watch TV all day.
  
3. According to the passage, today's culture...
  - a. is based entirely on television.
  - b. is very conscious of physical appearance.
  - c. breeds couch potatoes .
  - d. is completely sedentary.
  
4. From your reading of the passage, which of these statements about TV is not true?
  - a. Some programs are violent.
  - b. There is a lot of pop music on TV.
  - c. Many people are bored by TV.
  - d. Programs are getting better and better.
  
5. In general, the writer of the passage thinks that...
  - a. people are too conscious of their bodies.
  - b. too many people complain about TV.
  - c. it is better to exercise than watch TV.
  - d. watching paint dry is interesting.

**PART 3**

**Instructions:** Read the following job advertisements and then answer the questions. Choose ONLY ONE position for each person. Put the number of your answer in the parenthesis (5 points).

**Applying for a Job**

(1) Needed: Full time secretary position available. Applicants should have at least 2 years experience and be able to type 60 words during the evening. (2) Are you looking for a part time job? We require 3 part time shop assistants to work No experience required,

a minute. No computer skills required. Apply in person at United Business Ltd., 17 Browning Street

applicants should between 18 and 26. Call 366 - 76564 for more information.

**(3)** Computer trained secretaries: Do you have experience working with computers? Would you like a full time position working in an exciting new company? If your answer is yes, give us a call at

**(4)** Teacher Needed: Tommy's Kindergarten needs 2 teacher/trainers to help with classes from 9 a.m. to 3 p.m. Applicants should have appropriate licenses. For more information visit Tommy's Kindergarten in Leicester Square No. 56

**(5)** Part Time work available: We are looking for retired adults who would like to work part time at the weekend. Responsibilities include answering the telephone and giving customer's information. For more information contact us by calling

### Questions:

- A.** Jane Madison. Jane recently retired and is looking for a part time position. She would like to work with people and enjoys public relation work.

The best job for Jane is ( )

- B.** Margaret Lillian. Margaret is 21 years old and would like a part time position to help her pay her university expenses. She can only work in the evenings.

The best job for Margaret is ( )

- C.** Alice Fingelhamm. Alice was trained as a secretary and has six years of experience. She is an excellent typist but does not know how to use a computer. She is looking for a full time position.

The best job for Alice is ( )

- D.** Peter Florian. Peter went to business school and studied computer and secretarial skills. He is looking for his first job and would like a full time position.

The best job for Peter is ( )

- E.** Vincent san George. Vincent loves working with children and has an education license from the city of Birmingham. He would like to work with young children.

The best job for Vincent is ( )

## PART 4

**Instructions:** Rea Here is the story with ten words missing. Choose one these ten words, then fill in the blanks with the correct letter (10 points).

### A Typical Shop Worker's Desk

a. Telephone	b. Workers	c. untidiest	d. work	e. dirty
f. machine	g. equipment	h. sit down	i. task	j. various

Shop workers probably have the **1**\_\_\_\_\_ desks of all. The desks of shop workers are used for a number of purposes. They often have a computer and a **2**\_\_\_\_\_ to take care of paper **3**\_\_\_\_\_, but they also use their desk as a place to lay their various **4**\_\_\_\_\_ as they work at their different tasks. In many **5**\_\_\_\_\_ shops, you will also be surprised at how **6**\_\_\_\_\_ a shop worker's desk is! Shop workers have to do a variety of **7**\_\_\_\_\_ tasks that often involve greasy equipment. Of course, the grease from the tools and the **8**\_\_\_\_\_ dirty the desk as the shop worker sits down to do a report or make a telephone call. Shop **9**\_\_\_\_\_ usually don't clean their desk too often as they know that the desks will just get dirty the next time they **10**\_\_\_\_\_ to have a cup of coffee.

### PART 5

**Instructions:** Read the text below and then put the letter you decide which word (A, B, C or D) best fits each space (5 points).

#### Feeling tired

A year ago, Laura reached her lowest **(0)** **A.** Utterly exhausted after a short walk, she was **(1)**..... up off the pavement and driven home by the police. 'My feet felt nailed to the ground,' she recalls. With permanent flu **(2)**....., panic stricken and confined to a wheelchair, she was eventually diagnosed as having chronic fatigue syndrome, the term doctors now use for her illness. Laura, a 30-year-old marketing manager, has since made a remarkable **(3)**..... in her health. She is now able to walk for an hour, swims twenty lengths three times a week and is **(4)**..... going back to work. She **(5)**..... her new-found sense of well-being down to a technique called cognitive behaviour therapy.

#### Questions:

**0**    **A** point                      **B** mark            **C** time            **D** degree

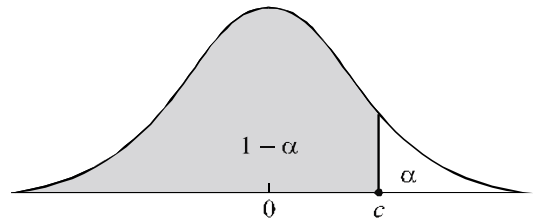
**1**    **A** collected            **B** moved        **C** taken        **D** picked  
Clue: This is a phrasal verb with a literal meaning.

**2**    **A** indications        **B** signs            **C** symptoms **D** characteristics  
Clue: Which of these words do you associate most strongly with illness or medical matters?

- 3    **A** renewal            **B** return    **C** recovery    **D** restoration  
Clue: Which word do you most associate with getting better after an illness?
- 4    **A** contemplating    **B** regarding    **C** reflecting    **D** judging  
Clue: Only one of these words comes before an '-ing' form – 'going'.
- 5    **A** puts                **B** gets        **C** takes        **D** turns  
Which phrasal verb has the *form* 'to.... sth down to sth' meaning 'to explain or account for sth'?

- THANK YOU -

### ANNEX 3. T-STUDENT DISTRIBUTION TABLE



		$1 - \alpha$						
$r$	0.75	0.80	0.85	0.90	0.95	0.975	0.99	0.995
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704
60	0.679	0.848	1.046	1.296	1.671	2.000	2.390	2.660
120	0.677	0.845	1.041	1.289	1.658	1.980	2.358	2.617
$\infty$	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576

## 15. HOUSING AND FACILITIES

General	In order to perform maintenance on articles listed on its approval capabilities lists, CEMEFA provides suitable housing for facilities, equipment, materials, and personnel consistent with its ratings. This repair station meets the requirements as expressed in FAR 145.103. A layout provided on the following pages.
Location	<p>The Electronics Maintenance Center (CEMEFA) Repair Station is located at Guayaquil, Ecuador.</p> <p style="text-align: center;">Av. de las Américas S/N, junto a la Aviación Naval, Aeropuerto Internacional José J. de Olmedo.</p>
Housing	<p>The CEMEFA repair station has an total area of 450 m2, distributed in the following areas:</p> <p>Offices</p> <ul style="list-style-type: none"> <li>▪ Management Office</li> <li>▪ Secretary's Office</li> <li>▪ Technical library</li> <li>▪ Classroom</li> <li>▪ Quality Control Department Office</li> <li>▪ Production Control Department Office</li> <li>▪ Engineering Department Office</li> <li>▪ Parts and Spare Warehouse</li> <li>▪ Finances Office</li> <li>▪ Clients reception</li> </ul> <p>Laboratories</p> <ul style="list-style-type: none"> <li>▪ Electrical and Instruments Laboratory</li> <li>▪ Com/Nav Laboratory</li> </ul> <p>The infrastructure comprising offices and laboratories are cement-built with asbestos roofing, with the following areas:</p> <ul style="list-style-type: none"> <li>▪ 241 m2 for the administrative area.</li> <li>▪ 100 m2 for the laboratories.</li> <li>▪ 58 m2 for classrooms and technical library.</li> <li>▪ 51 m2 for warehouse.</li> </ul>
Facilities	<p>All offices and laboratory areas have fluorescent ceiling lighting fixtures.</p> <p>Both laboratories have benches with the following electrical installations:</p> <ul style="list-style-type: none"> <li>▪ 110 VAC - 60 Hz</li> <li>▪ 26 VDC</li> </ul>

	<ul style="list-style-type: none"> <li>▪ 115 VAC - 400 Hz - 3 ph</li> <li>▪ 14 VDC</li> <li>▪ 28 VDC</li> </ul> <p>All of the benches have systems of air to pressure.</p> <p>Electrical and Instruments Laboratory possesses a system of purification of air by means of ultraviolet lamps and air ionizers.</p> <p>All the laboratories have air conditioning systems to control the temperature of each area.</p> <p>Instrument and COM/NAV Laboratories are equipped with suitable racks, trays and stands for storage of all articles, depending on its current status.</p> <p>The Laboratory has two doors: one that opens directly to the offices and the other to the hangar, which also constitutes the “Emergency Exit”.</p> <p>The ramp across the hangar is reinforced concrete and is provided with high-power reflectors.</p> <p>Fire suppression equipment is provided throughout the facility as well.</p>
Support Equipment	CEMEFA has the required electronic pieces of equipment (see 4.1.4. Equipment and Materials Section).to perform maintenance of capabilities listed components.
Tools	The inventory of tools is available at the warehouse (see 4.1.4. Equipment and Materials Section).