Hope all is well. This is a preliminary design document of a class that I had to design and implement on an LMS for over 400 technicians to take monthly→done because of a scheduling nightmare due to various shifts and 24/7 operation. I formally have scheduled technicians for this class and many others utilizing excel. This project was done utilizing project management software <Microsoft project> to keep track of milestones and to provide management with a timeline. Done under budget and on time.

LOCK OUT/TAG OUT for MAINTENANCE PERSONNEL PORTFOLIO

IDT 520

Instructional Systems Analysis and Design

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December 6, 2024

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Appendix A

Executive Summary:

TITLE: LOCK OUT/TAG OUT SAFETY PROGRAM CLASS IMPLEMENTATION

DESCRIPTION: Lock Out/Tag Out is a procedure when utilized will ensure all energy sources are eliminated before working on industrial machinery.

TARGET LEARNERS: FedEx Maintenance Personnel consisting of Electrical, Electronic, General and HVAC technicians.

GOAL OF THE PROJECT: Train technicians on the proper procedure for Lock Out/Tag Out.

RATIONALE: Is to provide an on-line class that can be taken at any time with step-by-step procedures and assessments that will certify technicians in the proper procedure of applying Lock Out/Tag Out safety measures to industrial machinery.

Needs Assessment

INSTRUCTION RATIONALE: Facilities Maintenance Technicians are comprised of Electrical, Mechanical, Heating Ventilation and Air Conditioning and General personnel. Based on the Safety records obtained from studies done for OSHA, many technicians have been injured when working on industrial equipment. Because of this, A Lock Out Tag Out program was implemented to combat the safety problem.

PROBLEM: It was discovered that Facility Maintenance technicians do not understand the procedure for Locking Out and Tagging Out Industrial machinery before repair work is done and how to return the industrial machinery back to service. This was evident based on the following problems and analysis.

- Student performance was less than desired.
- Based on the benchmark level, many students testing fell below the minimum level.
- With so many technicians with different shifts, time limitation and scheduling were difficult.
- The training class contained unneeded information which attributed to long class times.

Based on the problems above, quantitative and qualitative data was obtained from existing data safety records, technician class schedules, and length of classes. To determine if the classes should be redesigned to be more effective. Table 1: lists summary data obtained from safety records, scheduling of classes and survey average which averages the points from each manager's employees survey. Survey questions can be found in the Appendix.

MANAGER	# OF DIFFERENT SHIFTS	# OF EMPLOYEES	INJURIES PERCENTAGE	SURVEY AVERAGE
BOGGAN	9	28	13.33	2.35
DUNN	10	16	19.05	1.80
ASELIN	12	21	38.1	1.56
MITCHELL	7	13	38.46	1.43
SHOOPS	6	24	8.33	2.61
DOLLAR	9	28	32.14	2.10
GERMAIN	4	18	14	2.02
JOHNSON	9	24	3	1.41
MCPHATTER	5	28	16	2.03
PHILLIPS	4	14	7	1.84
GLASS	5	14	3	1.71
PROCTOR	10	30	13	2.07
ARONSON	5	21	9	1.28
MCMILLIAN	14	28	5	1.79
MCCOURT	4	26	9	2.11
NIBLETT	7	28	8	2.06
STEPHENS	7	24	5	1.83
SMITH	8	25	9	1.69
BAY	7	28	11	2.40
Total = 19		Total = 438		

TABLE 1: Data obtained from scheduling information in Appendix A

Analyzing the table, there was a total of nineteen managers. Each manager has a different number of shifts and employees. Each Manager has a key index percentage. This percentage is the number of

accident injuries pertaining to Lock Out Tag Out per employee shifts (for reference see Manager Statistical Information Appendix A). While there is no acceptable percentage margin greater than 0, the approach is to achieve a percentage toward zero. For most of the managers, the percentage was above 10 (4th column in the table), which is the lowest acceptable value. The training class implemented was supposed to alleviate this percentage, however, it did not. The benchmark level mentioned above was not met. Upon further analysis, there were a total number of shifts per manager that ranged from 4 to 14. Although some managers had the same shifts as others, to begin to count the number of distinct unique shifts, a count was done for different shifts from the first three managers see Tables 2,3 and 4, which amounted to 31 (shifts column).

MANAGER	SHIFTS	TOTALS	INJURIES	SURVEY AVERAGE
BOGGAN	HC	2	1	NO DATA
	ID	1	0	2
	WC	1	0	3
	4K2	3	0	3
	IM	1	0	2
	IK2	1	0	2
	1C	3	1	2.33
	HD	2	0	3.5
	WD	1	0	1
	#OF DIFFERENT SHIFTS	TOTAL EMPLOYEES	TOTAL INJURIES	SURVEY POINT AVERAGE
TOTALS	9	15	2	2.35375
INJURY PERCENTAGE			13.33%	

Table 2: Manager one different shifts

MANAGER	SHIFTS	TOTALS	INJURIES	SURVEY AVERAGE
DUNN	AZ1	3	2	1
	AE	1	0	2
	AC	5	0	2
	BE	1	0	2
	RC	1	0	3
	AC	5	0	2
	AK2	2	1	2
	AA	1	1	2
	RZ1	1	0	1
	BK2	1	0	1
	#OF DIFFERENT SHIFTS	TOTAL EMPLOYEES	TOTAL INJURIES	SURVEY POINT AVERAGE
TOTALS	10	21	4	1.8
INJURY PERCENTAGE			19.05%	

Table 3: Manager two different shifts

MANAGER	SHIFTS	TOTALS	INJURIES	SURVEY AVERAGE
ASELIN	BK2	2	2	1.5
	EK1	1	1	0
	IK2	3	1	1.67
	FK2	4	2	1.5
	MZ1	2	1	1.5
	MC	2	0	3
	MK2	2	0	2.5
	MK1	1	1	0
	IK1	1	0	1
	AK2	1	0	2
	IJ	1	0	3
	EJ	1	0	1
	#OF DIFFERENT SHIFTS	TOTAL EMPLOYEES	TOTAL INJURIES	SURVEY POINT AVERAGE
TOTALS	12	21	8	1.555833333
INJURY PERCENTAGE			38.10%	

Table 4: Manager three different shifts

Based on this data, the number of different shifts for the other 16 managers including the examples in the tables above contributed to scheduling difficulty (see Appendix A for an example of the first 3 managers schedules).

Analyzing the Qualitative data, survey averages were done to find out how technicians felt about the class. Surveys were given out with seven questions each. The questions pertained to criteria about the Lock Out Tag Out class. The first question pertained to the length of the class, was it too long, not long enough etc., the 2nd question wanted a rating of the knowledge of the instructor, did he/she know the material, and question 3 in this section was trying to determine if the employee honestly understood all procedures given in the class. Each question was based on 1 to 5 with 5 being strongly agree and 1 strongly disagree. The second section of questions were attempting to understand employee knowledge of L.O.T.O. before and after the class, if the material presented was useful, if it included manuals that were relevant to the class, understandable content and areas for note taking etc., and was the hands-on portion useful, could it be applied to any machine, any difficult procedures explained thoroughly etc. The second set of questions were rated with 5 being best and 1 worst.

As an example, Table 3, manager is Dunn, there were a total of 10 shifts, looking at the AZ1 shift, there were a total of 3 employees that made up the survey average of 1 point. As another example, referring to Table 4, shift FK2, 4 employees survey average was 1.5 points. This means in Table 4a in the Appendix which corresponds to Table 4, manager is Dunn, there were 4 employees that returned surveys with 2 for the survey average and 2 employees with a 1 for the survey average. Averaging them together gave 1.5 points. For each value obtained from the survey for each technician, please refer to the individual managers schedules in the Appendix.

Because the survey results were for most managers under 2.5 (Table 1) on a scale of 1-5, there was a problem with the training. Looking at the questions 2,3,4,6 and 7, the ones that received the lowest scores were: was the instructor knowledgeable, was the material understandable, comprehensible, length of class times, was the material useful and was the hands-on portion useful. Based on this feedback, class times needed to be more flexible, material used in the class did not support the instruction, there were too many differences, and the hands-on portion was not given in a manner that each technician felt comfortable with performing the procedures on their own. The most major concern was the class time availability which technicians scored very low on the surveys, because they had to work whole shifts and then attend mandatory L.O.T.O. Training.

INSTRUCTIONAL SOLUTION: based on the Quantitative and Qualitative data, it is recommended that the class be redone. To provide and instruct technicians on the types of hazards encountered in industrial machinery, how to properly isolate the hazards before work is done on the

machinery by using isolation devices and finally, how to return the machinery back to service by removing the isolation devices.

AKS Discrepancy Analysis

Desired Performance:

Facility Maintenance Technicians should be able to: understand the risks involved with industrial machinery, identify, isolate and verify all energy sources are removed before performing any maintenance and after maintenance, be able to return machinery back to service by removing those isolation devices.

Current Performance:

Currently, Facilities Maintenance Technicians are not familiar with the following when maintaining industrial machinery: the importance of properly understanding the risks involved, the isolation of all energy hazards involved utilizing isolation devices, and the proper removal of isolation devices to return equipment back to service.

General Scope of Learning Content:

Skills that are prerequisites are:

- The ability to read and interpret readings on a multimeter.
- Understanding and use of proper hand tools.
- Understanding and use of personal protective equipment.

Task Analysis

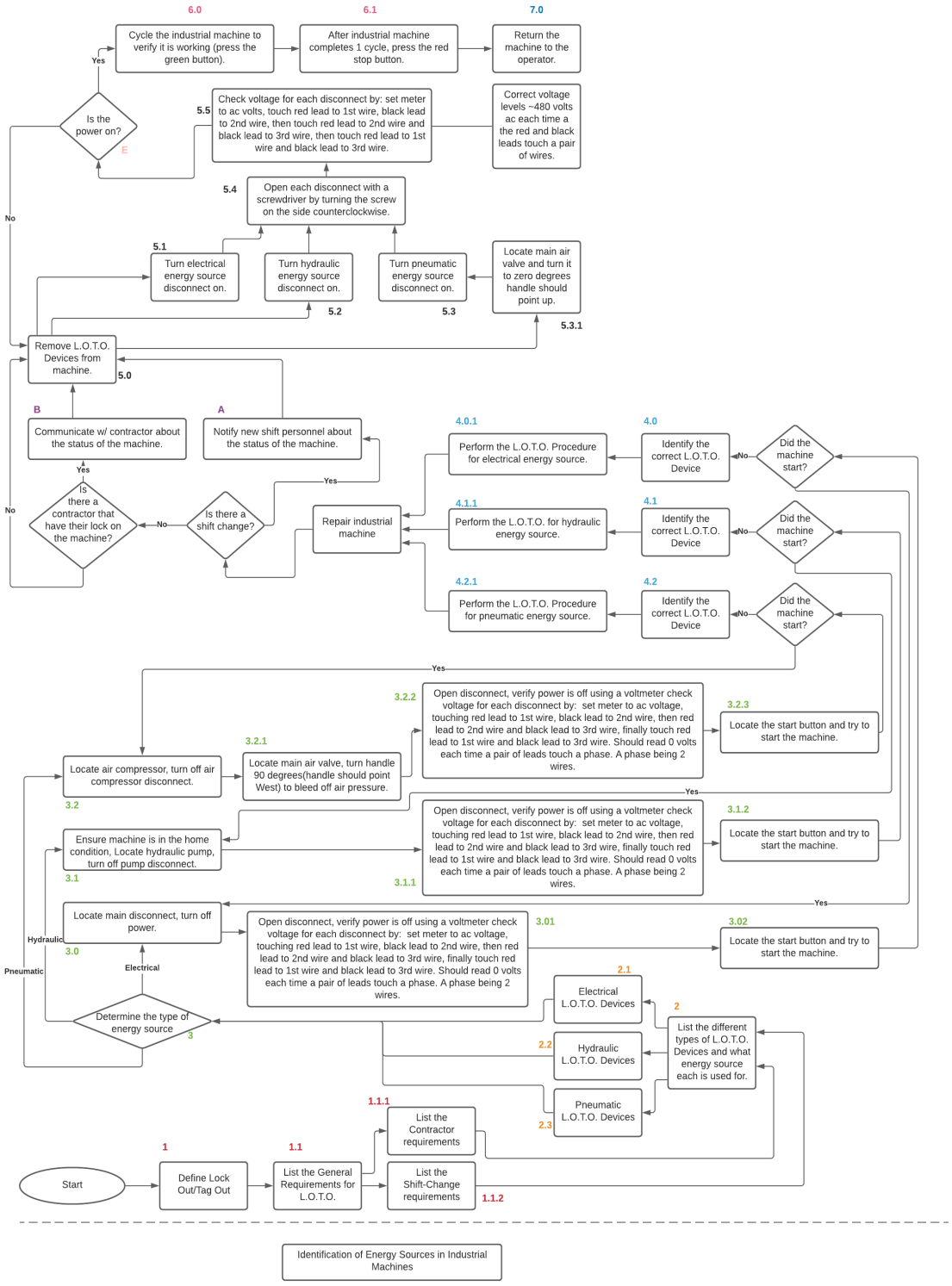


Figure 1: Procedural Task Analysis

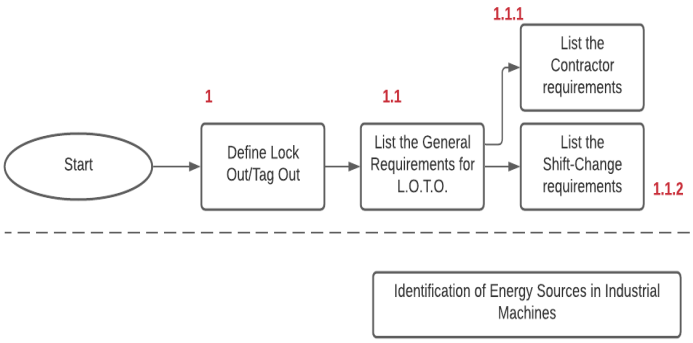


Figure 1A: Section 1 of the Procedural Task Analysis

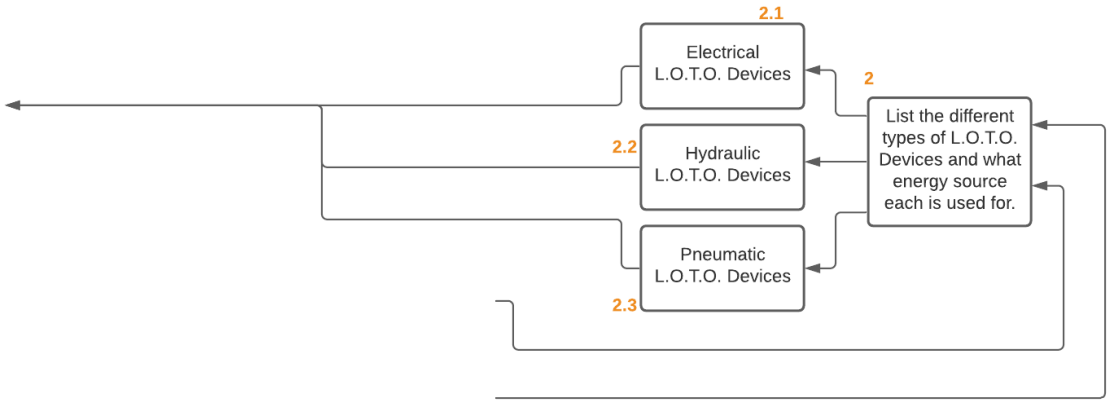


Figure 1B: Section 2 of the Procedural Task Analysis

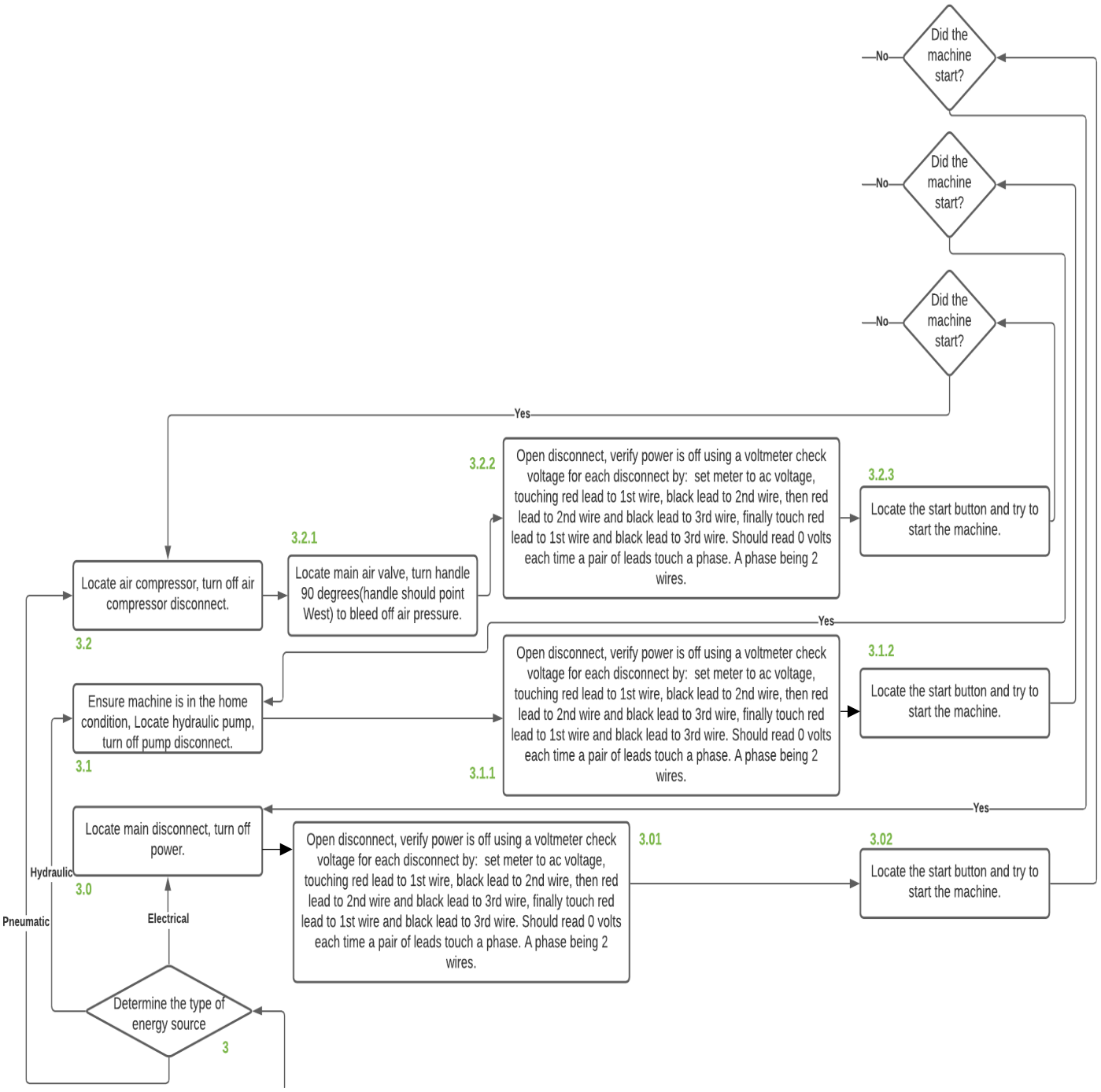


Figure 1C: Section 3 of the Procedural Task Analysis

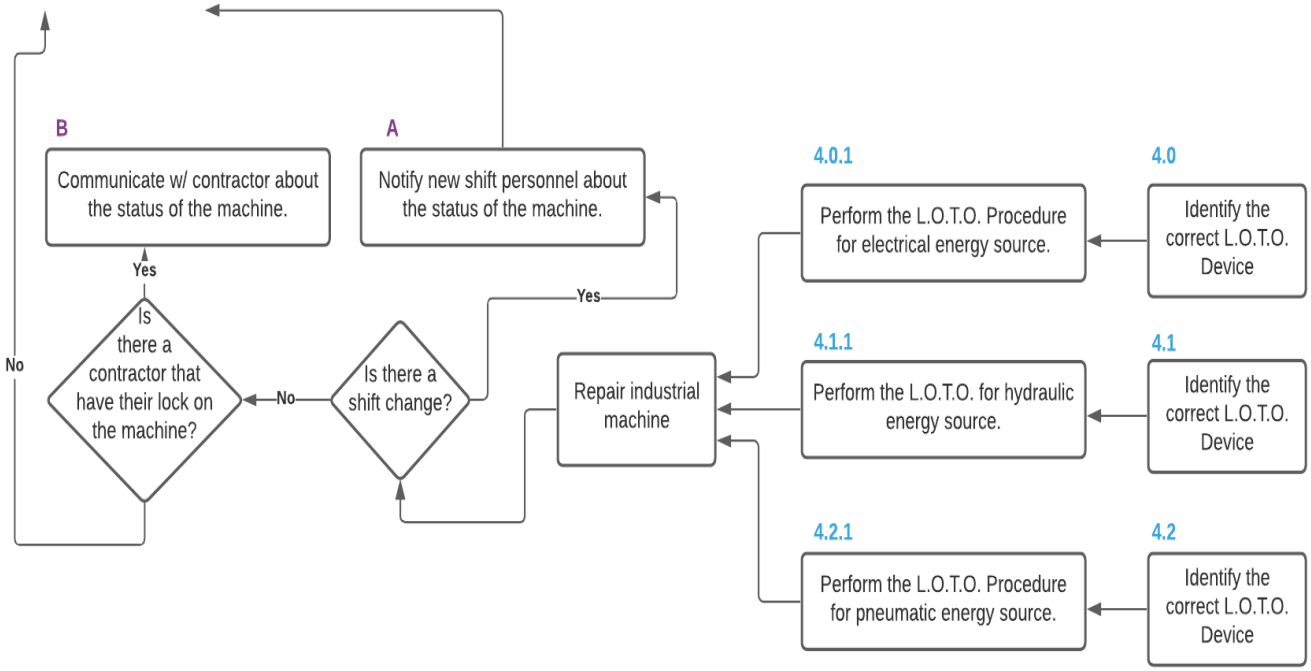


Figure 1D: Section 4 of the Procedural Task Analysis

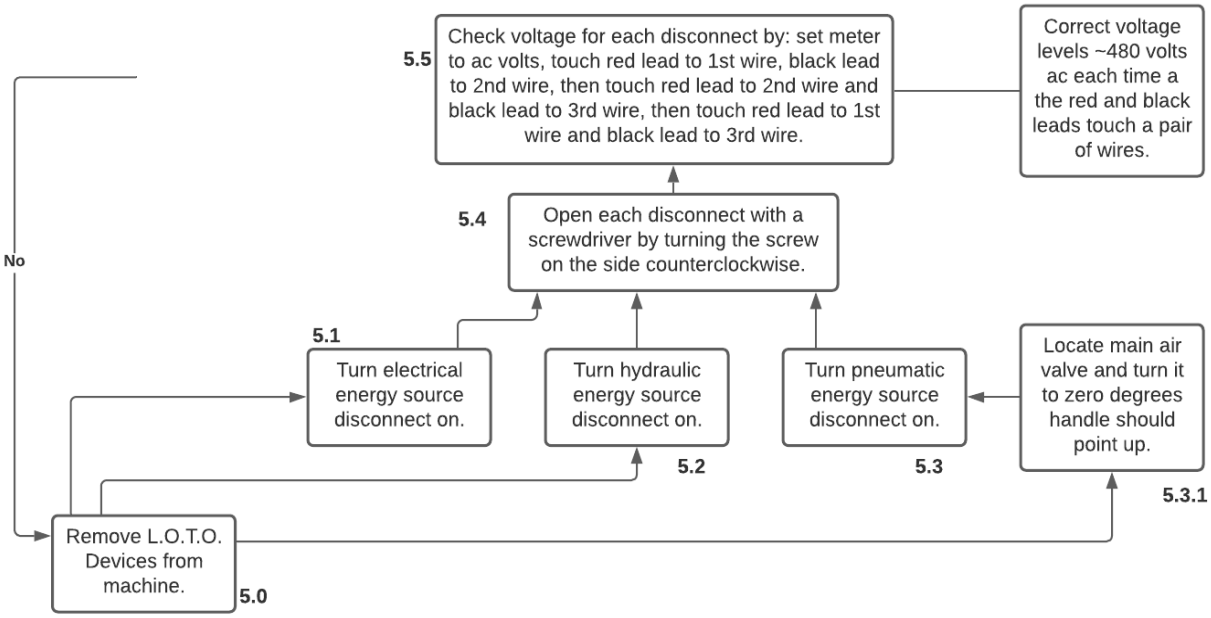


Figure 1E: Section 5 of the Procedural Task Analysis

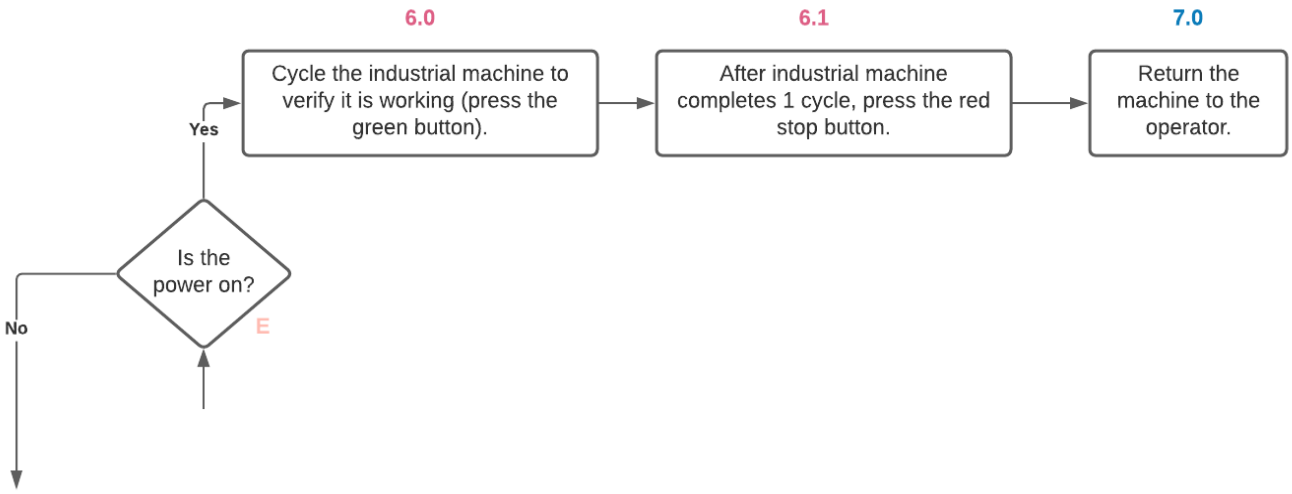
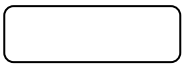
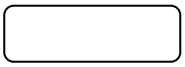
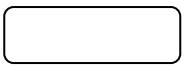
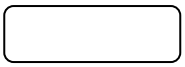
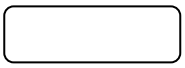
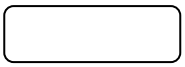
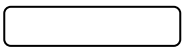
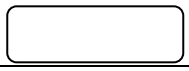
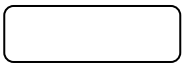
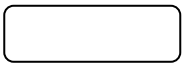
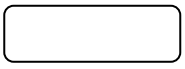
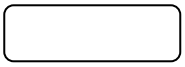


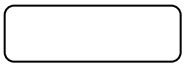
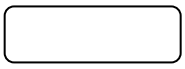
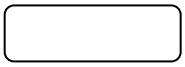
Figure 1F: Section 6 of the Procedural Task Analysis

Procedural Task Analysis Data Collection Form

STEP	TASK	TYPE	BRANCHES	NOTE
0	Identify all types of energy sources.	▭		
1	Define L.O.T.O.			
1.1	List general requirements of L.O.T.O.	▭		
1.1.1	List shift-change requirements	▭		
1.1.2	List contractor requirements.	▭		
2	List the different types of L.O.T.O. Devices and what each is used for.	▭		
3	Determine the type of energy(s)	◇	OPTIONS: Electrical 3.0 Hydraulic 3.1 Pneumatic 3.2	

3.0	Locate Disconnect, turn off power.			
3.0.1	Open disconnect verify power is off by using a multimeter.			
3.0.2	Locate the start button and try to start the machine.			
	Did the machine start?		No→4.0 Yes→3.0	
4.0	Identify the correct electrical L.O.T.O. Device			
4.0.1	Perform the L.O.T.O. procedure for electrical energy sources.			
3.1	Ensure machine is in the home condition. Locate pump, turn off power.			
3.1.1	Open disconnect verify power is off by using a multimeter.			
3.1.2	Locate the start button and try to start the machine.			
	Did the machine start.		No →4.1 Yes →3.1	
4.1	Identify the correct hydraulic L.O.T.O. Device.			
4.1.1	Perform the L.O.T.O. Procedure for Hydraulic energy source.			
3.2	Locate compressor, turn off power.			
3.2.1	Locate main air valve, turn handle 90 degrees to bleed off air pressure.			
3.2.2	Open disconnect, verify power is off by using a multimeter.			

3.2.3	Locate the start button and try to start the machine.			
	Did the machine start?		No →4.2 Yes →3.2	
4.2	Identify the correct pneumatic L.O.T.O. Device			
4.2.1	Perform the L.O.T.O. procedure for Pneumatic energy source.			
	Repair machine			
	Is there a shift change?		No →B Yes →A	
A	Notify new shift personnel about status of machine.			
B	Is there a contractor that have a lock on the machine?		No →5.0 Yes →C	
C	Communicate w/ contractor about the status of the machine.			
5.0	Remove all L.O.T.O. Devices from machine.			
5.1	Turn electrical energy source disconnect on.			
5.2	Turn hydraulic energy source disconnect on.			
5.3	Turn pneumatic energy source disconnect on.			
5.3.1	Locate main air valve and turn it to zero degrees. Handle should face North.			
5.4	Open each disconnect with a screwdriver by turning the screw on the side counterclockwise.			
5.5	Check voltage by, set meter to ac voltage, touching red lead to 1st			

	wire, black lead to 2nd wire, then red lead to 2nd wire and black lead to 3rd wire, finally, touch red lead to 1st wire and black lead to 3rd wire.			
5.5A	**Verify correct voltage levels, ~480 volts each time the red and black leads touch a pair of wires. <3 times>**			
	Is the power on?		**Yes→6.0** **No→5.0**	
6.0	**Cycle machine.**			
7.0	**Return machine to the operator.**			

Goal and Objectives

Goal Statement:

In this training class, technicians will demonstrate their knowledge of the L.O.T.O. Procedure in its entirety by identifying the different devices used in L.O.T.O., attaching them properly to an industrial machine, verifying power is removed from that machine, then returning the machine to its original state.

Learning Objectives:

1. Define Lock Out/Tag/Out.

Terminal Objectives:

Technicians will be able to demonstrate, by obtaining at least an <80%> passing mark in the assessment module, their ability to complete a General Requirements L.O.T.O. table within the Lock Out/Tag Out definition section of training.

Enabling Objectives:

1.1 List the General Requirements of L.O.T.O.
1.1.1 List the Shift-Change Requirements.
1.1.2 List the Contractor Requirements.

Learning Objectives:

2. List the different types of L.O.T.O. Devices and what energy source each is used for.

Terminal Objectives:

Technicians will be able to recall the different types of L.O.T.O. Devices used for different energy sources by obtaining at least an <80%> passing mark on the module assessment by listing and matching L.O.T.O. Devices with the correct energy sources within the L.O.T.O. and Energy section of the training.

Enabling Objectives:

2.1 List the different types of Electrical L.O.T.O. Devices.
2.2 List the different types of Hydraulic L.O.T.O. Devices.
2.3 List the different types of Pneumatic L.O.T.O. Devices.

Learning Objectives:

3. Apply the correct L.O.T.O. Device dependent upon the energy source used.

Terminal Objectives:

Technicians will be able to correctly identify and attach the L.O.T.O. Device to the industrial machine, by performing the procedure on an actual machine, which they must complete the procedure correctly to obtain a passing mark of at least an <80%> within the Identification and Attachment section of the training.

Enabling Objectives:

3.0 Perform the procedure of locating the electrical disconnect, then turn off power.
3.0.1 Open disconnect, verify power is off using a voltmeter check voltage for each disconnect by: set meter to ac voltage, touching red lead to 1st wire, black lead to 2nd wire, then red lead to 2nd wire and black lead to 3rd wire, finally, touch red lead to 1st wire and black lead to 3rd wire. Should read 0 volts each time pair of leads touch a phase, phase being 2 wires.
3.0.2 Perform the procedure of locating the start button and try to start the industrial machine.

4.0 Identify the correct electrical L.O.T.O. Device.
4.0.1 Correctly perform the L.O.T.O. procedure for the electrical energy source.

3.1 Perform the procedure of ensuring the industrial machine is in the home condition and locating the hydraulic pump, turn off power.
3.1.1 Open disconnect, verify power is off using a voltmeter Check voltage for each disconnect by: set meter to ac voltage, touching red lead to 1st wire, black lead to 2nd wire, then red lead to 2nd wire and black lead to 3rd wire, finally, touch red lead to 1st wire and black lead to 3rd wire. Should read 0 volts each time pair of leads touch a phase, phase being 2 wires.
3.1.2 Perform the procedure of locating the start button and try to start the machine.

4.1 Identify the correct hydraulic L.O.T.O. Device.
4.1.1 Correctly perform the L.O.T.O. procedure for the hydraulic energy source.

3.2 Perform the procedure of locating the air compressor pump, turn off power.
3.2.1 Locate the main air valve, turn handle 90 degrees (handle should point West) to bleed off air pressure.
3.2.2 Open disconnect, verify power is off using a voltmeter Check voltage for each disconnect by: set meter to ac voltage, touching red lead to 1st wire, black lead to 2nd wire, then red lead to 2nd wire and black lead to 3rd wire, finally, touch red lead to 1stwire and black lead to 3rd wire. Should read 0 volts each time pair of leads touch a phase, phase being 2 wires.

3.2.3 Perform the procedure of locating the start button and try to start the machine.

4.2 Identify the correct pneumatic L.O.T.O. Device.
4.2.1 Correctly perform the L.O.T.O. procedure for the pneumatic energy source.

Learning Objectives:

Removal of L.O.T.O. Devices from the industrial machine.

Terminal Objectives:

Technicians will be able to correctly remove the locks and tags from each energy source and verifying the voltage is at the proper level by performing the removal procedure on the industrial machine to obtain a passing score of 80% within the L.O.T.O. Removal section of the training.

Enabling Objectives:

A Notify new shift personnel if there is a shift-change.
B Communicate with a contractor if they have their lock on the machine.

5.0 Remove L.O.T.O. Devices from machine.
5.1 Turn electrical energy source disconnect on.
5.4 Open each disconnect with a screwdriver by turning the screw on the side counterclockwise.
5.5 Check voltage for each disconnect by: set meter to ac voltage, touching red lead to 1st wire, black lead to 2nd wire, then red lead to 2nd wire and black lead to 3rd wire, finally, touch red lead to 1st wire and black lead to 3rd wire.
5.5A Correct voltage levels: ~480 volts ac each time the red and black leads touch a pair of wires.
E If an incorrect reading, return to section 5.0.

5.2 Turn hydraulic energy source disconnect on.
5.4 Open each disconnect with a screwdriver by turning the screw on the side counterclockwise.
5.5 Check voltage for each disconnect by: set meter to ac voltage, touching red lead to 1st wire, black lead to 2nd wire, then red lead to 2nd wire and black lead to 3rd wire, finally, touch red lead to 1st wire and black lead to 3rd wire.
5.5A Correct voltage levels: ~480 volts ac each time the red and black leads touch a pair of wires.
E If an incorrect reading, return to section 5.0.

5.3 Turn pneumatic energy source disconnect on.
5.3.1 Locate main air valve and turn it to zero degrees. Handle should point up.
5.4 Open each disconnect with a screwdriver by turning the screw on the side counterclockwise.
5.5 Check voltage for each disconnect by: set meter to ac voltage, touching red lead to 1st wire, black lead to 2nd wire, then red lead to 2nd wire and black lead to 3rd wire, finally, touch red lead to 1st wire and black lead to 3rd wire.
5.5A Correct voltage levels: ~480 volts ac each time the red and black leads touch a pair of wires.
E If an incorrect reading, return to section 5.0.

Learning Objectives:

6 Verification that the industrial machine is working.

Terminal Objectives:

Technicians will be able to verify the power is on for all energy sources and will be able to demonstrate this by performing the procedure with a passing score of 80% within the Verification section of training.

6.0 Cycle machine to verify its working by pressing the start button(green).
6.1 After industrial machine completes a cycle, press the stop button(red)
7.0 Return industrial machine to the operator.

Learner/Contact Analysis

Description of Learners:

All technicians and trainees are between the ages of 22-70, have at least an associates degree or working towards one. Technicians in the Senior category have licenses and certifications that allow them to earn more and they posses as a minimum 6 years of related experience in an industrial environment. Junior technicians have at least 4 years of related experience and trainees are allowed to get their experience on the job.

- The primary learners for this Lock Out/Tag Out class are primarily Senior Electrical, Mechanical, Heating Ventilation, Air Conditioning, and General Technicians.
- The secondary learners consist of Junior technicians and technician trainees in the same job classifications.

Strengths:

- Enthusiasm/Confidence
- Excellent troubleshooting ability.
- Posses' the theory behind machine operation and components.
- Ability to multitask and perform duties across many different crafts.

Weaknesses:

- Majority has limited understanding of different types of L.O.T.O. Locks and tags.
- Lack attention to detail when safety is the main objective.
- Many prefer to absorb information and not think for themselves (dependency problems).

Potential difficult areas consist of dealing with 3 phase-power, how to safely work on a machine. Dealing with electricity because of its dangers, many are afraid and do not understand the procedures that must be followed. Energy sources have always been taboo because technicians generally relied on electricians to handle electrical sources. Technicians also take energy sources for granted which has caused numerous accidents due to the lack of power verification before repairs.

	Characteristics	Brief Description	Instructional design implication
Strengths	Enthusiasm/Confidence	Excited about working on machines.	Important to emphasize how safety can add a measure of confidence.
	Excellent Abilities	Troubleshooting techniques.	Address the importance of troubleshooting techniques when dealing with machines by providing information on unclear procedures. Hands on testing emphasized throughout class.
	Knowledge	Understanding of machine theory.	Guide students on how to identify and locate machine controls.

	Multitasking	Can work on several things at a time.	Emphasize the ability to understand combinations of technologies.
Weaknesses	Limitations	Limited understanding of different types of locks.	Job familiarity with several different L.O.T.O. Devices and the energy sources will be tested in the modules.
	Lacking	Attention to detail	Specifically break down steps of entire L.O.T.O. procedure
	Dependency	Depend on others	Provide detailed instruction to boost confidence in learners. Hands on skills needed in several testing modules.
	Insecure about 3 phase-power.	Students are nervous about energy sources.	Several modules will establish specifically the dos and don'ts of dealing with energy sources.
	Safety taken for granted.	Not paying attention to detail.	Instruction will emphasize the importance of safety and it will be tested in several modules.
Potential difficult content areas	Lack of understanding	Many don't understand the correct L.O.T.O. procedure.	There will be instruction testing and hands on application testing to make sure the proper L.O.T.O. procedure is understood.

Context Analysis

Description of learning Context:

Technicians will attend a class either on-line or in person for the theory part of the Lock Out/Tag Out training and then attend a hands-on class which will apply the principles learned in the modules from the on-line or instructor led class. The class will be held if instructor led in room A320 in the Properties and Facilities training room. The hands-on portion will be held in the East Matrix in the Memphis Hub by Motor Control Center MCC52. Periodically, all managers will attend the class.

	Brief description	Instructional design implication
Advantages	Instructor available for questions.	Instructor can help and explain each procedure in detail.
	Accessible to all technicians.	Depending on the type of instruction, classes are very flexible.
	Class can be tailor made to suit technicians.	Based on feedback, other supporting or least understood material can be added to the class.
Limitations	Employee work schedules may conflict with hands on classes.	Scheduling for hands on classes may be taught during a scheduled shift and may be covered with overtime.
Things should be complied	The L.O.T.O. class will be based on the OSHA required yearly training.	Module completions and hands on testing will need to be documented with a Learning Management System for each technician.
	All safety training is mandatory.	The classes must be completed and verified that each employee is capable of the performing the procedures of L.O.T.O.
	Safety Training at FedEx has always been taken seriously.	Training layout and class materials, must be kept being reviewed by OSHA to determine if it is following established guidelines.

Delivery System:

The delivery of this instruction will be hybrid. It will consist of an on-line portion which students can take anytime at work and an instructor led portion which can be taken during their shift or on overtime. Students can take the on-line portion at there own pace, although once they start, they must continue until the end to receive credit in the Learning Management System. Any problems or concerns can be addressed by the instructor.

BLUEPRINT ASSESSMENT

FORMATIVE ASSESSMENT

CONTENT OUTLINE	KNOWLEDGE	COMPREHENSION	APPLICATION	ANALYSIS	SYNTHESIS	EVALUATION
I. Definition of Lock Out/Tag Out.		**1.** The student will be able to define L.O.T.O. **FAI_01** **1.1** The student will be able to list all requirements of L.O.T.O. **FAI_02**				
25% 2		100% 2				
II. Different types of L.O.T.O. Devices and their Energy Sources.		**2.** The student will be able to list the different types of L.O.T.O. devices. **FAI_03** The student will be able to classify and characterize each energy source. **FAI_04**	The student will be able to determine the correct L.O.T.O. Device with the correct energy source. **FAI_03**			
20% 2		50% 2	50% 1			
III. Application of L.O.T.O. Devices.		**3.** The student will list and recall the safety procedures when dealing with energy sources and verify machine is in a safe condition. **FAI_05**	The student will be able to attach the correct L.O.T.O. device to the correct energy source on the machine. **<Hands On test>**			
25% 2		60% 1	40% 1			
IV. Removal of L.O.T.O. Devices.		**5.0, A, B** The student will be able to list the removal procedure for L.O.T.O. devices **FAI_06** The student will be able to list the procedure for the removal other locks that may be present. **FAI_07**	The student will demonstrate their ability to remove a L.O.T.O. device only after all requirements are met. **<Hands on test>**			
25% 3		50% 2	50% 1			
V. Prepare machine for operation.			6.0 The student will be able to verify that power is present. **FAI_08**			

						The student will demonstrate their ability to verify machine can be cycled. <Hands on test>					
5%	1					100%	1				
100%	10										

Formative Evaluation

Content: Lock Out/Tag Out Procedure

Objective: The student will be able to define and list the requirements of L.O.T.O.

FAI_01→ Lock Out/Tag Out is a procedure for preventing hazards with machines by controlling _____sources. Please write your answer in the blank provided. **ANSWER:** energy

FAI_02→ Controlling hazardous energy requires 2 devices to be attached to a machine to prevent its operation. Please list them in the spaces provided. a._____, b._____.

ANSWERS: lock, tag

Objective: The student will be able to list the different types of L.O.T.O. Devices and the corresponding energy source that goes along with each.

FAI_03→ Write the correct device name by the correct picture for the following L.O.T.O. Devices.

a._____ L.O.T.O. Device **ANSWER:** hydraulic

b. _____ L.O.T.O. Device **ANSWER:** pneumatic

c._____ L.O.T.O. Device **ANSWER:** electrical

FAI_04→ Write the name of the energy source in the blank provided for each type of energy.

1. This source involves the transfer of electrons to perform work. _____.
2. Air is the medium by which work is performed with this source. _____.
3. The transfer of fluid by which work is performed is the main characteristic of this source. _____.

ANSWERS: 1. Electrical 2. Pneumatic 3. Hydraulic

Objective: The student will be able to apply and utilize safety procedures when attaching the correct L.O.T.O. Device to the machine.

FAI_05→ For the question below, write the correct order of operations for the Lockout/Tagout requirements. Begin with the number 1.

_____ISOLATE

_____ATTACH LOCKOUT/TAGOUT DEVICE

_____RELEASE STORED ENERGY

_____SHUTDOWN

_____TEST THE EQUIPMENT

_____PREPARE

ANSWERS: 1. PREPARE, 2. SHUTDOWN, 3. ISOLATE, 4. ATTACH LOCKOUT/TAGOUT DEVICE, 5. RELEASE STORED ENERGY, AND 6. TEST EQUIPMENT.

FAI_06→ For the question below, please write the correct order of operations for the Removal Procedure for Lockout/Tagout. Begin with the number 1.

_____REMOVE LOCKOUT/TAGOUT DEVICE(S).

_____TEST THE EQUIPMENT.

_____NOTIFY ALL AFFECTED PERSONS THAT THE LOCKOUT/TAGOUT DEVICES ARE TO BE REMOVED.

_____INSPECT THE WORK AREA.

_____INFORM ALL CONCERNED PARTIES THAT THE WORK HAS BEEN COMPLETED.

ANSWERS: 1. INSPECT THE WORK AREA, 2. NOTIFY ALL AFFECTED PERSONS THAT THE LOCKOUT/TAGOUT DEVICES ARE TO BE REMOVED, 3. REMOVE LOCKOOUT/TAGOUT DEVICES, 4. TEST THE EQUIPMENT AND 5. INFORM ALL CONCERNED PARTIES THAT THE WORK HAS BEEN COMPLETED.

FAI_07→ Complete the following word puzzle by drawing a line through the correct letters to spell the words that describe exceptions to the removal of another person's Lock or Tag including contractors. Please be sure to list them in the correct order. 1st one has been done for you.

1.__CONFIRMS___

2._____

3._____

4._____

C	O	N	F	I	R	M	S	B	C
A	T	T	E	M	P	R	T	U	F
R	S	T	P	M	E	T	T	A	D
I	V	N	Y	P	X	Y	C	R	A
F	Z	Y	N	T	P	R	S	U	A
I	V	E	R	I	F	I	E	S	Y
S	M	R	O	F	N	I	Y	Z	X

ANSWERS: CONFIRMS, ATTEMPTS, VERIFIES, INFORMS

FAI_08→ Complete the following matrix for testing a 3-phase circuit. Write in what lead is supposed to touch which wire. The first phase is done as an example.

PHASE	WIRE 1	WIRE 2	WIRE 3
PHASE 1	RED LEAD	BLACK LEAD	
PHASE 2			
PHASE 3			

ANSWERS:

PHASE	WIRE 1	WIRE 2	WIRE 3
PHASE 1	RED LEAD	BLACK LEAD	
PHASE 2		RED LEAD	BLACK LEAD
PHASE 3	RED LEAD		BLACK LEAD

SUMMATIVE ASSESSMENT

CONTENT OUTLINE	KNOWLEDGE	COMPREHENSION	APPLICATION	ANALYSIS	SYNTHESIS	EVALUATION
I. Definition of Lock Out/Tag Out.		**1.** The student will be able to define L.O.T.O. **SAI_01** **1.1** The student will be able to list all requirements of L.O.T.O. **SAI_02**				
25% 2		100% 2				
II. Different types of L.O.T.O. Devices and their Energy Sources.			The student will be able to list the required specs for approved Locks and Tags for each L.O.T.O. Device. **SAI_03**			
25% 1			100% 1			
III. Application of L.O.T.O. Devices.			The student will be able to attach the correct L.O.T.O. device to the correct energy source on the machine. **<Hands On test>**			
25% 1			100% 1			
IV. Removal of L.O.T.O. Devices.		**5.0, A, B** The student will be able to list the removal procedure for L.O.T.O. devices **SAI_04** The student will be able to list the procedure for the removal of other locks that may be present. **SAI_05**	The student will demonstrate their ability to remove a L.O.T.O. device only after all requirements are met. **<Hands on test>**			
25% 3		50% 2	50% 1			
V. Prepare machine for operation.			**6.0** The student will be able to verify that power is present.			

						<Hands on test> The student will demonstrate their ability to verify machine can be cycled. **<Hands on test>**					
25%	**2**					**100%**	**2**				
100%	**9**										

Summative Evaluation

Objective: The student will be able to define and list the requirements of L.O.T.O.

SAI_01→ Maintenance personnel have the responsibility of ensuring that machinery, equipment and processes are stopped and isolated from all potentially hazardous energy sources along with being _____ and/or_____ before any maintenance or servicing is performed.

ANSWERS: locked, tagged

SAI_02→For the question, place the number of the item on the bottom that matches the sentence(s) on the top. The most important requirements for L.O.T.O. are:

1. The equipment must be _____to protect against accidental or unintended operation that might cause serious Injury or fatality.
   a. tested
   b. made safe
   c. isolated but not tested
   d. locked
   e. tagged
   f. not tagged

2. The equipment shall be _____ by getting rid of_____ leaving the equipment inoperable.
   a. Safe
   b. Locked
   c. Electrical Energy but not hydraulic energy
   d. Removing Hydraulic power
   e. Isolated and tagged
   f. Tagged
   g. Energy
   h. Isolated

ANSWERS: Q1. locked, tagged, tested Q2. Safe, isolated, energy

Objective: The student will be able to list the required specifications for approved Locks and Tags used in L.O.T.O.

SAI_03→ Match the correct letter with the approved L.O.T.O. Devices column.

a. Be the only device used for L.O.T.O.
b. Personnel or combination locks ***CANNOT*** be used.
c. Be made resistant to weather conditions that may cause the tag to deteriorate or become impossible to read.
d. Must have the identification of the employee applying it.
e. Be capable of withstanding the environment to which they are exposed.
f. Indicate the identity of the employee by the following: Name, Trade, Shift, Department, Time & Date.

SAFETY LOCKS SHALL	IDENTIFICATION TAGS SHALL

ANSWERS:

SAFETY LOCKS SHALL	IDENTIFICATION TAGS SHALL
a	c
b	f
d	
e	

Objective: the student will list in correct order and procedures when removing Locks and/or Tags.

SAI_04→ For the question below, please choose the correct items for the Removal Procedure for Lockout/Tagout in the correct order.

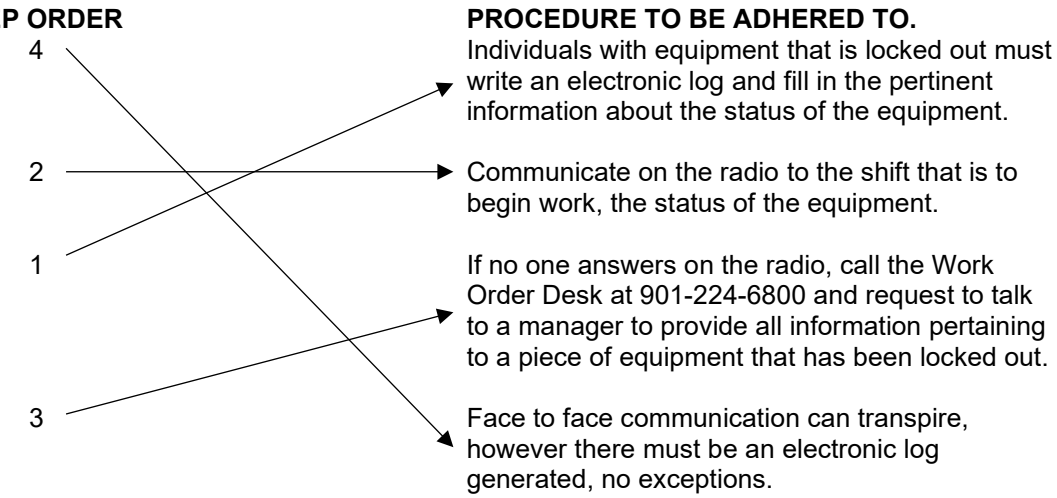
a. REMOVE LOCKOUT/TAGOUT DEVICE(S).
b. TEST THE EQUIPMENT.
c. NOTIFY ALL AFFECTED PERSONS THAT THE LOCKOUT/TAGOUT DEVICES ARE TO BE REMOVED.
d. MAKE SURE GUARDS ARE IN PLACE.
e. INSPECT THE WORK AREA.
f. INFORM ALL CONCERNED PARTIES THAT THE WORK HAS BEEN COMPLETED.
g. MAINTAIN A LOG OF THE REPAIR.

ANSWERS: a, b, c, e, f

SAI_05→For the question below, please draw an arrow from the step to the correct procedure when a shift change happens.

STEP ORDER	PROCEDURE TO BE ADHERED TO.
4	Individuals with equipment that is locked out must write an electronic log and fill in the pertinent information about the status of the equipment.
2	Communicate on the radio to the shift that is to begin work, the status of the equipment.
1	If no one answers on the radio, call the Work Order Desk at 901-224-6800 and request to talk to a manager to provide all information pertaining to a piece of equipment that has been locked out.
3	Face to face communication can transpire, however there must be an electronic log generated, no exceptions.

ANSWERS:



CHECKLIST

Hands on Portion

Although OSHA requires several key concepts that can be tested on paper, there are several skills that must be performed to be L.O.T.O. compliant. There is a maintenance environment that consists of machines in Secondary 20/21 of the FedEx Memphis World Hub. This area will be used to determine if the students have comprehended the material in this class. It will involve demonstrating the following:

- Attachment of the correct L.O.T.O. Device to the correct energy source and verifying the machine is in a safe manner to perform maintenance.
- Removal of the L.O.T.O. Devices and the requirements that must be adhered to.

- Demonstrate the machine is in an operable state for the operator.

The following Checklist will be used:

PROCEDURE STEPS	PASS→O	FAIL→X
Verification of power removal.		
Attachment of L.O.T.O. Devices.		
Removal of L.O.T.O. Devices.		
Verification of power to machine.		
Cycle machine		

Students must score 100% to obtain a passing mark on the hands-on portion of the final exam.

DESIGN

General Instructional Implications & Instructional Strategies/Activities

Underlying Instructional Method

Lock/Out Tag/Out Training for technicians has traditionally been taught as an instructor led class. This is due to many of the procedures in the class being performance based. However, there are other components of the class that are declarative such as learning types of devices, names of energy sources etc. The class also includes some concept-based objectives also. These concepts include understanding and being able to identify and distinguish the make-up of different energy sources. For this class, conceptual knowledge is the premise used because the student must comprehend, apply, and analyze information in-order to maintain safety in an industrial environment. The expository approach is used in this class due to the presentation of very critical information and concepts. The class only allows for additional types of energy that must be locked out, the students don't have to explore or discover the concepts as done in the inquiry approach. The student only must learn the basics, then they can translate that to any

energy source to be locked out. The procedure is the same, ensuring all energy sources are locked and tagged.

Global Instructional Strategies

1. Learners come from many different technical backgrounds so basic instruction from simple procedures to complex ones taken into consideration.
2. Basic concepts and general instruction will be referenced throughout class.
3. Lesson will be broken down into modules with an assessment to ensure concepts are understood.
4. Hands on portion will be instructor led and will contain an assessment in order to receive a passing score.
5. All modules should contain objectives that provide enough information so the student can comprehend and refer to if needed.
6. Instructor is available to aid and answer questions, provide pointers, and help technicians to overcome fears about energy sources.
7. Assessments are geared towards OSHA defined standards and concepts that need to be understood.

LEARNING MATRIX

Learning Objectives	Content	Bloom's Taxonomy	Potential Difficulties	Possible causes for the difficulty	Instructional Strategies	Assessment
I. Define Lock Out/Tag Out	1.Define L.O.T.O.	Comprehension	N/A	N/A	Association	**FAI_01**
	1.1 List all requirements of L.O.T.O.	Comprehension	N/A	N/A	Provide a reference sheet w/ requirements	**FAI_02**
II. List the different types of L.O.T.O. Devices and what energy source each is used for.	2. List the different types of L.O.T.O. Devices	Comprehension	Many different devices and energy sources.	Need to ensure clarification of which device goes with which energy source.	Provide a reference sheet w/ requirements	**FAI_03**
	Classify and characterize each energy source.	Comprehension	N/A	N/A	Provide a reference sheet w/ requirements	**FAI_04**
	Determine the correct L.O.T.O. Device with the correct energy source.	Application	Many different devices and energy sources.	Need to ensure clarification of which device goes with which energy source.	Present examples/non-examples	**FAI_03**
III. Application of L.O.T.O. Devices	3. List and recall the safety procedures when dealing with energy sources and verify machine is in a safe condition.	Comprehension	Potential anxiety about energy sources.	Never worked directly with all energy sources.	Provide a reference sheet with safety procedures and job aide to show how to verify machine state.	**FAI_04**
	Attach the correct L.O.T.O. device to the correct energy source on the machine.	Application	N/A	N/A	Present examples/non-examples	**Hands on**
IV. Removal of L.O.T.O. Devices from the industrial machine.	5.0, A, B. List the removal procedures for L.O.T.O. Devices	Comprehension	N/A	N/A	Provide reference sheet.	**FAI_06**

	List the procedure for the removal of other locks that may be present.	Comprehension	N/A	N/A	Provide reference sheet	**FAI_07**
	Demonstrate how to remove a L.O.T.O. Device only after all requirements are met.	Application	N/A	N/A	Present examples/non-examples	**Hands on**
V. Prepare machine for operation.	Verify power is present.	Application	Unfamiliar with how to read a multimeter.	Never had a chance to utilize a multimeter or other test equipment to aid in testing energy sources.	Present examples/non-examples	**FAI_08**
	Demonstrate how to cycle machine and verify its operation.		N/A	N/A	Present examples/non-examples	**Hands on**

Materials to be Developed

- Based on the requirements from OSHA, 3 assessments and a final checkpoint with a hands-on lab to verify students understand of all procedures.
- Provide reference sheets for all requirements of L.O.T.O., energy sources, L.O.T.O. Devices, and safety procedures.
- Ensure there is a summary of what is to be learned in each module.
- Provide a summary of what the main take away will be from the class.
- A reference job aide to provide step by step instructions on how to use a multimeter or other testing instruments for the verification of power.
- Provide job aides to support how to attach and remove L.O.T.O. Devices.
- Provide a game to show do's and don'ts of handling electrical sources due to them being the most prevalent in every machine.
- Utilization of record keeping such as a Learning Management System and sign in sheets to record attendance since it will checked occasionally by OSHA.

INSTRUCTIONAL PLAN

Event	Content	Script (S)/Specific Description (SD)	Strategies	Embedded Item #	Materials Developed
E1. Gain Attention.	N/A	**(S)** After intro music plays to gain attention, what, do you think L.O.T.O. stand for?	Invoke curiosity.	N/A	Define L.O.T.O. on the course introductory page.
E2. Inform students of Objectives for the course.	N/A	**(SD)** List the modules with objectives.	Expository organizer.	N/A	Develop Expository organizer.
E3. Stimulation of prior knowledge.	N/A	**(SD)** How many energy sources can you name and describe a characteristic of each?	Invoke curiosity.	N/A	Develop job aide with major energy sources and their characteristics.
E4. Present stimuli	Lock Out/ Tag Out Basics	**(SD)** In-order to understand the L.O.T.O. Procedure, we must cover the basics. In this module you will learn: L.O.T.O. definitions and terms, the general requirements of L.O.T.O., requirements needed for a shift change, and contractor responsibilities.	Present information to be learned each objective in this module.	FAI_1, FAI_2	Develop job aide with general definitions and requirements.
E5. Provide guidance		**(S)** Provide definitions to the following, tag out and lock out devices, list the general requirements, the most important ones and when lockout/tagout is required.	Provide these items in a format that helps them remember.		Include visuals of the general requirements of L.O.T.O.
E6. Elicit performance		**(SD)** Present practice questions on the general requirements, L.O.T.O definitions and terms	Score	N/A	N/A
E7. Provide feedback		Lock Out/Tag Out is a procedure for preventing hazards with machines by controlling energy sources. Correct Controlling hazardous energy requires 2 devices to be attached to a machine to prevent its operation. Please list them in the spaces provided. Lock and tag. Correct	Provide feedback	N/A	N/A
E4. Present stimuli	Energy sources and L.O.T.O. devices	**(SD)** List different energy sources and their corresponding L.O.T.O. devices.	Present the energy sources along with their corresponding L.O.T.O. devices.	FAI_03, FAI_04	Develop job aide with L.O.T.O. devices and their corresponding energy sources.
E5. Provide guidance		**(S)** Provide characteristics and explanations of which device goes with what energy source.	Provide info notes on how to identify		Include visuals on L.O.T.O. devices and

			energy sources and devices.		what energy sources they are used for.
E6. Elicit Performance		**(SD)** Present practice questions on L.O.T.O. devices and energy sources.	Score	N/A	N/A
E7. Provide feedback		Write the correct device name by the correct picture for the following L.O.T.O. Devices.  Hydraulic--Correct  Chemical--Incorrect  Pneumatic—Incorrect Write the name of the energy source in the blank provided for each type of energy. This source involves the transfer of electrons to perform work. Electrical--Correct Air is the medium by which work is performed with this source. Hydraulic--Incorrect The transfer of fluid by which work is performed is the main characteristic of this source. Thermal--Incorrect	Provide feedback	N/A	N/A
E4. Present stimuli	L.O.T.O. procedure	**(SD)** List the entire L.O.T.O. procedure how to verify power is off, which L.O.T.O. device to use and how to remove the L.O.T.O. device and place machine back in service.	Present the entire procedure step by step.	FAI_5,6,7,8	

E5. Provide Guidance		**(S)**Provide an example of each step.	Develop a game to help learn the steps involved.		Include visuals and provide job aides with entire procedure.
E6. Elicit Performance		**(SD) Present practice questions ono the L.O.T.O. procedure.**	Score	N/A	N/A
E7. Provide feedback		For the question below, write the correct order of operations for the Lockout/Tagout requirements. Begin with the number 1. ___3____ISOLATE ___4___ATTACH LOCKOUT/TAGOUT DEVICE ___5____RELEASE STORED ENERGY ___2____SHUTDOWN ___1___TEST THE EQUIPMENT ___6____PREPARE 4 OUT OF 6 Correct missed the last two For the question below, please write the correct order of operations for the Removal Procedure for Lockout/Tagout. Begin with the number 1. ___5____REMOVE LOCKOUT/TAGOUT DEVICE(S). ___2____TEST THE EQUIPMENT. ___4____NOTIFY ALL AFFECTED PERSONS THAT THE LOCKOUT/TAGOUT DEVICES ARE TO BE REMOVED. ___3_____INSPECT THE WORK AREA. ___1_____INFORM ALL CONCERNED PARTIES THAT THE WORK HAS BEEN COMPLETED. All answers were incorrect. Complete the following word puzzle by entering the correct letters to spell the words that describe exceptions to the removal of another person's Lock or Tag including contractors. 1. C_NF_R_S that the employee who applied the device is not available to remove it. 2. AT_EMP_S all contact efforts to the contact the employee is unsuccessful. 3. VERIFIES that there are no present hazards by removing the device. 4. INFORMS the employee of emergency removal upon return to the facility by email verification.	Provide feedback.	N/A	N/A

<table>
<tr><td></td><td></td><td>Missed first two questions.

Complete the following matrix for testing a 3-phase circuit. Write in what lead is supposed to touch which wire. The first phase is done as

<table><tr><th>PHASE</th><th>WIRE 1</th><th>WIRE 2</th><th>WIRE 3</th></tr><tr><td>PHASE 1</td><td>RED LEAD</td><td>BLACK LEAD</td><td></td></tr><tr><td>PHASE 2</td><td></td><td>R</td><td>R</td></tr><tr><td>PHASE 3</td><td>R</td><td></td><td>B</td></tr></table>an example.
Missed phase B.</td><td></td><td></td><td></td></tr>
<tr><td>E8. Assess Performance</td><td>N/A</td><td>N/A</td><td>Summative Evaluation+ Hands on lab</td><td>N/A</td><td>N/A</td></tr>
<tr><td>E9. Enhance Retention/Transfer</td><td>N/A</td><td>Provide the necessary job aides and retest every 12 months.</td><td>Encourage questions in the lab.</td><td>N/A</td><td>Printable job aides from the online and the instructor provided for the lab portion.</td></tr>
</table>

APPENDIX A:

Contents

Manager schedules 3 examples

FIRST NAME	LAST NAME	EMPLOYEE #	EMAIL ADDRESS	SHIFT-DAYS	SHIFT CODE	SHIFT TIMES	MANAGER	DATE	TIMES	INJURIES	SURVEY RATINGS 5 BEST 1 POOR
Roger	Achelpohl	3595008	roger.achelpohl@fedex.com	MON,TUE,THU,FRI	HC	17:00-03:30	BOGGAN	9-Jul	19:00pm-03:30am	X	NO DATA
DavID	Backowicz	483573	davID.bakowicz@fedex.com	WED-SAT	ID	21:00-07:30	BOGGAN	9-Jul	19:00pm-03:30am		2
Richie	Becton	281006	richie.becton@fedex.com	SUN-WED	WC	16:00-02:30	BOGGAN	9-Jul	19:00pm-03:30am		3
James	Driver	5189649	james.driver@fedex.com	MON-FRI	4K2	22:00-06:00	BOGGAN	9-Jul	19:00pm-03:30am		4
Richard	Gibson	2346563	richard.gibson@fedex.com	MON-FRI	4K2	22:00-06:00	BOGGAN	9-Jul	19:00pm-03:30am		2
Corey	Jones	5144014	coreyajones@fedex.com	MON-FRI	4K2	22:00-06:00	BOGGAN	9-Jul	19:00pm-03:30am		3
Cedric	Myles	5144096	cedric.myles@fedex.com	MON,TUE,THU,FRI	IM	21:00-07:30	BOGGAN	9-Jul	19:00pm-03:30am		2
Joseph	Savage	3649735	joseph.savage@fedex.com	MON-FRI	1K2	20:00-04:30	BOGGAN	9-Jul	19:00pm-03:30am		2
Mark	Escue	276113	mbescue@fedex.com	SUN-WED	1C	20:00-06:30	BOGGAN	10-Jul	19:00pm-03:30am		1
Steve	Horton	5144132	steven.horton@fedex.com	WED-SAT	HD	17:00-03:30	BOGGAN	10-Jul	19:00pm-03:30am		3
Wayne	Landry	331788	gwlandry@fedex.com	SUN-WED	1C	20:00-06:30	BOGGAN	10-Jul	19:00pm-03:30am		4
Paul	Lawrence	3677070	paul.laerence@fedex.com	WED-SAT	WD	16:00-02:30	BOGGAN	10-Jul	19:00pm-03:30am		1
Jared	Poe	5231256	jared.poe@fedex.com	WED-SAT	HD	17:00-03:30	BOGGAN	10-Jul	19:00pm-03:30am		4
Stephen	Publicover	5256723	Stephen-Publicover@fedex.com	SUN-WED	1C	20:00-06:30	BOGGAN	10-Jul	19:00pm-03:30am	X	2
Barnabas	Tabor	339527	btaborjr@fedex.com	SUN-WED	HC	17:00-03:30	BOGGAN	10-Jul	19:00pm-03:30am		NO DATA

Table 2a: Manager Boggan employee schedule.

FIRST NAME	LAST NAME	EMPLOYEE #	EMAIL ADDRESS	SHIFT-DAYS	SHIFT CODE	SHIFT TIMES	MANAGER	DATE	TIMES	INJURIES	SURVEY RATINGS 5 BEST 1 POOR
Jesus	Carbajal	5104266	jesuscarbajal@fedex.com	MON,TH,FRI,SAT	AZ1	06:00-16:30	DUNN	9-Jul	8-5PM	X	1
Byron	Chapman	331975	blchapman@fedex.com	TUE-FRI	AE	06:00-16:30	DUNN	10-Jul	8-5PM		2
William	Dixon	760573	william.dixon@fedex.com	SUN-WED	AC	06:00-16:30	DUNN	9-Jul	8-5PM		4
Johnny	Dorsey	22004	jodorsey@fedex.com	TUE-FRI	BE	07:00-17:30	DUNN	10-Jul	8-5PM		2
Joshua	Forbess	3650411	joshua.forbess@fedex.com	MON,TH,FRI,SAT	AZ1	06:00-16:30	DUNN	9-Jul	8-5PM	X	1
Bob	Gamble	5052324	aaron.gamble@fedex.com	SUN-WED	RC	09:00-19:30	DUNN	9-Jul	8-5PM		3
Marcus	Henderson	450181	mark.henderson@fedex.com	SUN-WED	AC	06:00-16:30	DUNN	9-Jul	8-5PM		2
Martin	Johnson	524994	martin.johnson@fedex.com	MON,TH,FRI,SAT	AZ1	06:00-16:30	DUNN	9-Jul	8-5PM		1
Cleadus	Jones	404639	cejones4@fedex.com	SUN-WED	AC	06:00-16:30	DUNN	9-Jul	8-5PM		2
Randy	McCammon	913534	randy.mccammon@fedex.com	MON-FRI	AK2	06:00-14:30	DUNN	9-Jul	8-5PM		4
Sam	Morris	434410	samuel.morris@fedex.com	SUN-WED	AC	06:00-16:30	DUNN	9-Jul	8-5PM		2
George	Nutzell	488954	george.nutzell@fedex.com	SUN-WED	AC	06:00-16:30	DUNN	9-Jul	8-5PM		2
Michael	Raburn	482556	michael.raburn@fedex.com	SUN,THUR,FRI,SAT	AA	06:00-16:30	DUNN	10-Jul	8-5PM	X	2
Kieth	Reece	582028	582028@fedex.com	MON-FRI	AK2	06:00-14:30	DUNN	9-Jul	8-5PM	X	NO DATA
Rodney	Spearman	5050278	rodney.spearman@fedex.com	MON,TH,FRI,SAT	RZ1	09:00-19:30	DUNN	9-Jul	8-5PM		1
Danny	Vasquez	760509	fidencio.vasquez@fedex.com	MON-FRI	BK2	07:00-15:30	DUNN	9-Jul	8-5PM		1

Table 3a: Manager Dunn employee schedule.

LAST NAME	EMPLOYEE #	EMAIL ADDRESS	SHIFT-DAYS	SHIFT CODE	SHIFT TIMES	MANAGER	DATE	TIMES	INJURIES	SURVEY RATINGS 5 BEST 1 POOR
Anderson	832385	michaelanderson@fedex.com	MON-FRI	BK2	07:00-15:30	ASELIN	13-Jul	8-5PM	X	NO DATA
Anderson	784518	kerwin.anderson@fedex.com	TUE-SAT	EK1	13:00-21:00	ASELIN	12-Jul	19:00pm-03:30am	X	NO DATA
Andrews	5144119	edwardiii@fedex.com	MON-FRI	IK2	21:00-05:30	ASELIN	12-Jul	19:00pm-03:30am	X	2
Brown	5144091	kevin.brown@fedex.com	MON-FRI	FK2	14:00-22:00	ASELIN	12-Jul	19:00pm-03:30am	X	1
Clarkson	5144131	christopher.clarkson@fedex.com	MON-FRI	IK2	21:00-05:30	ASELIN	12-Jul	19:00pm-03:30am		1
Donelson	1213217	eldridge.donelson@fedex.com	MON-FRI	FK2	14:00-22:00	ASELIN	12-Jul	8-5PM		1
Elrod	338865	blelrod@fedex.com	MON,TH,FRI,SAT	MZ1	05:00-15:30	ASELIN	12-Jul	8-5PM		2
Evans	307981	maevans1@fedex.com	SUN-WED	MC	05:00-15:30	ASELIN	12-Jul	8-5PM		4
Evans	65918	nlevans@fedex.com	MON-FRI	MK2	05:00-13:30	ASELIN	12-Jul	8-5PM		3
Hudspeth	3590939	ricky.hudspeth@fedex.com	MON-FRI	FK2	14:00-22:00	ASELIN	12-Jul	19:00pm-03:30am		2
James	10821	fbjames@fedex.com	MON-FRI	MK2	05:00-13:30	ASELIN	12-Jul	8-5PM		2
Jenkins	593421	howard.jenkins@fedex.com	MON-FRI	IK2	21:00-05:30	ASELIN	12-Jul	19:00pm-03:30am		2
Oglesby	5131204	jamie.oglesby@fedex.com	TUE-SAT	MK1	05:00-13:30	ASELIN	12-Jul	8-5PM	X	NO DATA
Oliver	5253059	anterious.oliver@fedex.com	TUE-SAT	IK1	21:00-05:30	ASELIN	12-Jul	19:00pm-03:30am		1
Peters	425087	larry.peters@fedex.com	MON-FRI	FK2	14:00-22:00	ASELIN	12-Jul	19:00pm-03:30am	X	2
Pierson	448697	neil.poerson@fedex.com	SUN-THURS	EJ	13:00-21:30	ASELIN	12-Jul	19:00pm-03:30am		1
Rigby	760507	john.rigby@fedex.com	MON-FRI	AK2	06:00-14:30	ASELIN	12-Jul	8-5PM		2
Sargent	15341	kgsargent@fedex.com	MON-FRI	BK2	07:00-15:30	ASELIN	12-Jul	8-5PM	X	3
Shaw	59544	tim.shaw@fedex.com	SUN-THURS	IJ	21:00-05:30	ASELIN	12-Jul	19:00pm-03:30am		3
Sitzes	25398	bmsitze@fedex.com	SUN-WED	MC	05:00-15:30	ASELIN	12-Jul	8-5PM		2
Skelton	760576	stanley.skelton@fedex.com	MON,TH,FRI,SAT	MZ1	05:00-15:30	ASELIN	12-Jul	8-5PM	X	1

Table 4a: Manager Aselin employee schedule.

Manager statistical information 3 examples:

MANAGER	SHIFTS	TOTALS	INJURIES	SURVEY AVERAGE
BOGGAN	HC	2	1	NO DATA
	ID	1	0	2
	WC	1	0	3
	4K2	3	0	3
	IM	1	0	2
	IK2	1	0	2
	1C	3	1	2.33
	HD	2	0	3.5
	WD	1	0	1
	#OF DIFFERENT SHIFTS	TOTAL EMPLOYEES	TOTAL INJURIES	SURVEY POINT AVERAGE
TOTALS	9	15	2	2.35375
INJURY PERCENTAGE			13.33%	

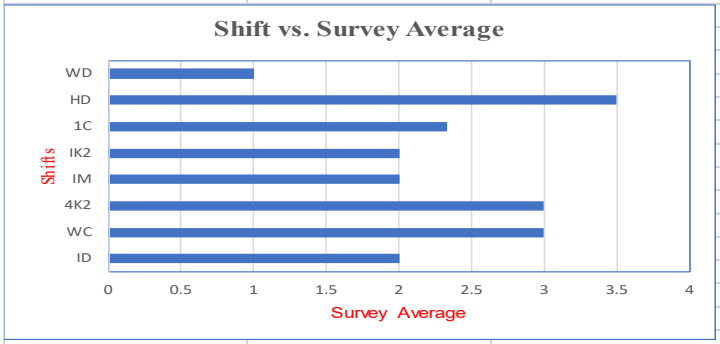


FIGURE 1: Shift vs. Survey Average

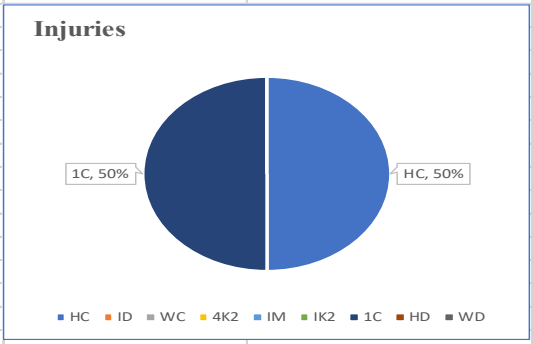


FIGURE 2: Injuries per Shift

MANAGER	SHIFTS	TOTALS	INJURIES	SURVEY AVERAGE
DUNN	AZ1	3	2	1
	AE	1	0	2
	AC	5	0	2
	BE	1	0	2
	RC	1	0	3
	AC	5	0	2
	AK2	2	1	2
	AA	1	1	2
	RZ1	1	0	1
	BK2	1	0	1
	#OF DIFFERENT SHIFTS	TOTAL EMPLOYEES	TOTAL INJURIES	SURVEY POINT AVERAGE
TOTALS	10	21	4	1.8
INJURY PERCENTAGE			19.05%	

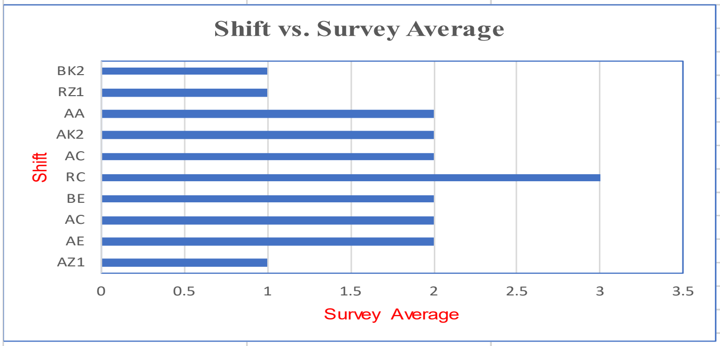


FIGURE 3: Shift vs. Survey Average

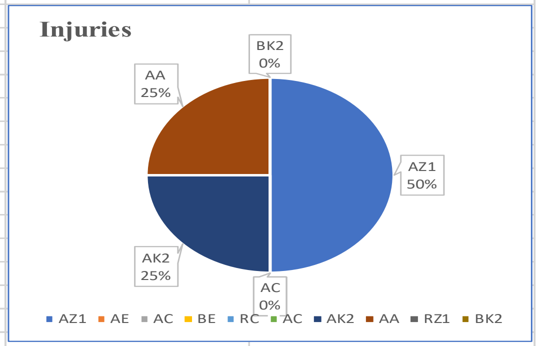


FIGURE 4: Injuries per Shifts

Technician survey questionnaire

Please rate the following Questions from 1 to 5 with 5 being you strongly agree.

<-->

5. strongly agree 4. somewhat agree 3. neutral 2. disagree 1. strongly disagree

1. Was the length of class too long? ____________________
2 Was the Instructor knowledgeable about the information given in the class. ____________________
3. Did you understand the material in its entirety? ____________________

Please rate the following questions from 1 to 5 with 5 being great and 1 worse.

<-->

5. great 4. good 3. average 2. below average 1. worse

4. Rate your knowledge on L.O.T.O. before the class. ____________________
5. Rate your knowledge on L.O.T.O. after the class. ____________________
6. Was the material presented useful? ____________________
7. Was the hands-on portion useful? ____________________

Employee Name: ____________________
Badge number: ____________________
Manager: ____________________