



More skills ... more opportunities

Professional Skills Record

Industrial Electrician

NOC 7242

ACKNOWLEDGEMENTS

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This handbook is designed to help skilled trades Journeypersons manage the skills and learning of their Apprentices who are using a Professional Skills Record.

1 Why Do I Need this Handbook?

Eighty percent of all learning in a trade happens on the job. This means the apprentice has the responsibility to learn and you, as their journeyperson, have the responsibility to mentor and teach.

Signing off for the learning an apprentice has completed under your supervision is a huge responsibility. With all the skills needed in a trade, it is important that both you and the apprentice have a tool to help you record and sign off on that learning.

2 But We Have Logbooks

When a tradesperson registers as an apprentice in most provinces or territories in Canada, they are given a Logbook.

A Logbook:

- is issued by the apprenticeship authority within a jurisdiction
- is created from the National Occupational Analysis (NOA) in a trade
- is a list of all the general skill areas (**Blocks and Tasks**) in a trade
- records an apprentice's progress in the general skill areas of a trade
- is signed off by a journeyperson to guarantee that an apprentice is performing these tasks to Industry Standard.

A Logbook lists the Blocks and Tasks from the NOA **but** the Interprovincial Red Seal exam and trades training courses in colleges and trade schools use **all** the information in the NOA. This includes the Blocks, Tasks, **Sub-tasks and the Knowledge and Abilities** listed in the NOA.

Each apprentice needs a tool that lists **all** the skills and learning they need in their trade career. Then, if they have one employer or several employers over their entire term of apprenticeship, both the apprentice and the journeyperson know what learning has been completed:

- the journeyperson knows what skills they are signing off to verify what has been taught; and
- the apprentice knows what they need to learn to be successful in their Red Seal exam.

3 What is a National Occupational Analysis (NOA)?

The Canadian Council of Directors of Apprenticeship, which is made up of managers and directors of apprenticeship from every province and territory in Canada, guides a Human Resources and Skills Development Canada (HRSDC) sponsored program to develop NOAs.

Under this partnership, joint planning committees made up of tradespeople who have a Certificate of Qualification, Red Seal endorsement from each province and territory in Canada, come together in Ottawa every four to five years to review and revise the NOA in all of the 45 skilled trades.

Each NOA is accepted as the national standard in that trade. The NOA is then used to:

- identify and group tasks performed by skilled workers in each trade in every province and territory in Canada
- group these tasks by Blocks, Tasks, Sub-tasks, Knowledge, Skills and Abilities (also called "**competencies**") required in a trade
- give information on the breakdown of questions from all sections of the NOA in the Interprovincial Red Seal exam
- create all the questions for the Red Seal exam
- create curriculum for trade school programs and Block Release/Period/Level* programs in a trade.

* *The in-school portion of apprenticeship has several names across Canada. In some provinces and territories it is called Block Release, in others it is called Period Training or Level.*

4 If there is an NOA, why do we need a Professional Skills Record (PSR)?

The NOA is designed to be used for creating curriculum and for developing test questions for the Red Seal exam.

The PSR is designed to be used by an apprentice and a journeyperson in the workplace. The PSR provides a fair and objective assessment tool to record the apprentice's learning and skills.

The PSR has been developed **with** apprentices during a three-year research project on PEI called Trade Essentials. Recommendations made by the apprentices who tested the tool have been built into the document.

The PSR was then validated by teams of tradespeople who have a Certification of Qualification, Red Seal endorsement in each trade who came together and discussed what an apprentice is expected to learn from their journeyperson in the workplace.

The apprentice has the main responsibility for completing the PSR. It is designed as a self-assessment tool so the apprentice can keep track of his/her skills and learning and make plans to fill any technical skills training gaps.

The PSR takes information from the NOA and:

- lays it out in a chart
- lists the percentage and number of questions for the Red Seal exam from each task on every page
- takes the skills from the NOA and describes them in terms of what a tradesperson does on the job, for example:
 - In the **NOA**, the skill says – “knowledge of blueprints and drawings”
 - In the **PSR**, the skill says – “read and interpret blueprints and drawings”
- has a rating chart so the apprentice can judge his/her level of learning and have it all recorded for you to review
- provides you, the journeyperson, with a tool to discuss details of an apprentice's skill areas that are great and areas that may need to improve
- helps the apprentice make a plan so he/she can improve skills
- helps you know what skills you still have to teach the apprentice.

5 Am I expected to teach all the skills in a PSR?

No. A PSR contains **all** the skills and learning a tradesperson has to learn over all their years as an apprentice. You, as their journey person, can help make this tool useful by completing the sign-off on the learning and skill you know they have. Some of the ways you can assess the skills your apprentice has are:

- **OBSERVATION** – you watch them use their knowledge, skills and abilities or competencies to perform a task or sub-task

For example, you ask them to select a tool for a specific job, then watch them use that tool to do a task.

- **INTERVIEW** – you have a discussion with your apprentice to find out if they can demonstrate an understanding of what they are doing

For example, you ask them to tell you about any safety precautions that have to be followed before they start a certain task.

- **DOCUMENTATION** – an apprentice may have a document that provides proof of skills they already have. You can use the PSR to sign-off on tasks the document covers. The document or certificate could be from:

- another employer,
- a trade school or college,
- an industry training course,
- another province or territory,
- or even from another country.

For example, you need all your employees to be trained in WHMIS. A new apprentice you just hired shows you a WHMIS certificate he/she have from a job they were working on a couple of months ago in northern Canada.

Apprentices will also tell you, through their self-assessments, the best way they think they can prove the skills they have. This can help guide you, as their mentor, to choose a way to assess your apprentice that works best for both of you.

6 Are there any tips on how to be a good mentor to my apprentice?

Mentoring has always been the foundation of apprenticeship. In trades, a mentor is a person who has a great deal of learning and skills from experience in a trade who helps a less experienced person by guiding, teaching and sharing their skills and learning.

Along with having learning and experience in their trade, the most successful mentors are:

- **Patient** - and understand the apprentice needs time to learn and practise their skills to become as good as their mentor.
- **Organized** - and set a schedule to meet regularly with their apprentice to track their learning and make plans for new learning.
- **Positive** - and supportive in helping an apprentice tackle new learning and encourage them to keep working on skills they find difficult to learn.
- **Respectful** - so that other employees in the workplace accept the apprentice and are willing to help and encourage the new apprentice.

As a mentor, you are a role model for your apprentice. To create a successful relationship between you and your apprentice you can:

- **Lead by example.** If you set safety and quality assurance as firsts on your list each and every day, so will your apprentice.
- **Build trust.** If you want your apprentice to trust and respect you, you can show trust in them by assigning them some responsibility as soon as you see an opportunity.
- **Communicate.** Communication is a two-way street. Be willing to listen as you give directions and be available to your apprentice when they need you. Always treat every question seriously. If your apprentice has the confidence to ask, it is important to give a respectful answer.
- **Be reliable.** Your apprentices need to know they can depend on you when they run into a problem. Create supportive relationships with other employees so if you are away from the workplace, your apprentice feels confident in approaching another employee for help.

6.1 Tips

- **Give clear instructions.** When assigning a task and giving direction, give step-by-step instructions, then ask your apprentice to repeat the instructions. This gives them the opportunity to ask questions on things that might not be clear to them.

Checklist for giving instructions:

- ✓ **explain the task**
 - ✓ **show them how it is done**
 - ✓ **answer their questions**
 - ✓ **oversee the work**
 - ✓ **give them time to practise**
 - ✓ **give feedback on how they are doing**
 - ✓ **take time to show them how to do the task better**
- **Give feedback.** Giving feedback often helps your apprentice to have a clear understanding of what you want them to do and how you want them to perform. The PSR helps you to give feedback because each knowledge, skills and ability (competency) statement is clear.

There are three types of feedback that work best in the workplace:

Positive feedback means you want your apprentice to continue what they are doing. People are motivated by hearing they are doing a good job. They usually do more and try harder.

Constructive feedback means you want your apprentice to change how or what they are doing. Offering support and guidance to your apprentice to make the changes you need usually brings the best results.

Direct feedback focuses on what you have seen, not on secondhand information. Focus on how the apprentice is doing and what you have planned for them to do.

- **Give your apprentice experience in many skills.** Sometimes apprentices end up performing the same set of skills over and over again because they are really good at them. They are required to learn the scope of the entire trade during their apprenticeship. If you have the capability, it would be helpful to take advantage of the opportunity to cover a wide range of skills by moving your apprentice from one set of skills to another on a regular basis.
- **Track and Document learning.** Every employer cannot offer an apprentice training in every skill in a trade because each workplace is unique. Some workplaces are specialists in one area of a trade.

As a journeyperson, you have the responsibility to sign off on the skills your apprentice learns under your guidance in your workplace. A PSR can help you identify those skills.

Setting a regular review date once every month or two, and keeping that time just for you and your apprentice, can increase their scope in their trade and increase their knowledge which will be an asset in the workplace.

This meeting time gives you the best opportunity to:

- monitor your apprentice's progress,
- make a plan with him/her to learn more skills, and
- find out if there are any problem areas where he/she may need help.

Regular meeting dates also help your apprentice to be prepared and able to track his/her learning. This can be done by using a Professional Skills Record (PSR).

7 So how do I use a Professional Skills Record (PSR) with my apprentice?

The PSR is laid out in a chart. Each skill your apprentice has to learn has an action word to tell them how they are supposed to perform a skill. It gives you a level you can use to judge whether they are performing that skill properly. **Industry standard** is the term used to describe when your apprentice can complete a task to the level and quality of performance required by industry without assistance or supervision.

When you see the words "demonstrate an understanding of," you may find it easier to ask them questions about the skill to make sure they know what they are doing.

**PROFESSIONAL SKILLS RECORD (PSR)
JOURNEYPERSON'S HANDBOOK**

Your apprentice has the responsibility to complete the "Knowledge, Skills and Abilities – Competencies" section.

When you are sure your apprentice has proven to you they have completed the learning they say they have, you verify it by initialing the sub-task.

Trade Name
IP Exam – 125 Questions
BLOCK A
5% - 6 questions on the IP
<u>Learning Category</u>
OCCUPATIONAL SKILLS
Task 1 – A
3 questions on the IP exam
<u>Learning Outcome</u>
Uses and maintains tools and equipment
Journeyman Sign-off
Task 1
Complete <input style="float: right; width: 30px; height: 15px; border: 1px solid black;" type="checkbox"/>
Incomplete <input style="float: right; width: 30px; height: 15px; border: 1px solid black;" type="checkbox"/>



Knowledge, Skills and Abilities - Competencies

SUB-TASK 1.01	1.01.01 Identify boring tools	1.01.02 Identify hand cutting tools
<u>Learning Objective</u> Uses hand tools	Rating ___ Complete Proof ___ Use ___ <input style="width: 20px; height: 15px; border: 1px solid black;" type="checkbox"/>	Rating ___ Complete Proof ___ Use ___ <input style="width: 20px; height: 15px; border: 1px solid black;" type="checkbox"/>
JP Sign-off ___		



When your apprentice proves to you that he/she has finished enough sub-tasks to have a good grasp of the task, you verify that learning by initialing "complete".



If your apprentice has not completed enough sub-tasks or you do not agree with the ratings they have given themselves, initial "incomplete".

<p>Task I Learning Needs</p> <p>Sub-Tasks <u>Learning Objectives</u> to be completed Comments</p>
--



If you have any sub-tasks you want your apprentice to work on, list them in this section and add any comments you have.

You might

- set a timeframe when you want these skills to improve
- suggest some manuals they could read
- suggest they go to their local college or training school for technical skills help
- suggest they go for help to an adult education facility if they need any academic help, for example, help in math or help in using the code book.

You have now created a learning plan for your apprentice using a PSR.

Your apprentice can then begin working on these sub-tasks or follow up on suggestions you have made to help them be successful in their trade career. By using a PSR, you now have a documented, written performance review that you can use in later sessions with your apprentice.

The PSR can help you give a fair assessment of your apprentice's ability to perform each technical skill task. If you are assigned an apprentice from another employer, province, territory or country, you can use the PSR to review his/her skills so you do not waste your valuable time teaching them skills they already know and can do.

PROFESSIONAL SKILLS RECORD

A tool for recording and recognizing skills and learning of trade apprentices

Industrial Electrician

NOC 7242

A project of:
The Province of PEI
and
Human Resources and Skills Development Canada



Human Resources and
Skills Development Canada

Ressources humaines et
Développement des compétences Canada

The **Professional Skills Record (PSR)** is a technical skills assessment tool designed to be used in the workplace by an apprentice and a journeyperson. The PSR has taken the content from the National Occupational Analysis (NOA) and arranged it so apprentices can use it to measure their progress in their trade from the time they sign up for apprenticeship through to Red Seal certification.

This PSR has been through a validation process with a team of trade professionals with Certificate of Qualification, Red Seal endorsement, who reached agreement on the wording of each and every knowledge and skill (*competency*) to make it measurable.

The PSR was originally designed as a tool to help apprentices move through a Recognition for Skills and Learning (RSL) process so they can receive recognition for skills they have, no matter where they learned them. Through completion of a PSR, they can avoid relearning what they already know and can do by entering the apprenticeship Block/Period/Level in-school process at a higher level. For example, move directly into Block/Period/Level three rather than relearning Block/Period/Level One and Two.

Feedback from testing and validation of the PSR has opened many new possibilities for using this tool. The PSR can be used:

- as a tool for valid assessment in a Recognition for Skills and Learning (RSL) process
- as a tool that new Canadians and people planning to emigrate can use, to assess their skills against Canadian standards, receive recognition for skills they already have and, if necessary, make a plan to fill any technical skill gaps they may still have
- in the secondary-school system and in post-secondary trades training so students can know the full scope of the trade they are entering
- as a tool to guide journeypersons while they are mentoring apprentices so they are aware of all the skills apprentices need to learn to be fully competent in their professional trade designation.

INFORMATION SITES:

PROJECT

SITE

CANADIAN

RED SEAL SITE

www.tradeessentials.ca

www.red-seal.ca

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Industrial Electrician Trade Information

Name: _____ Full Address: _____
Email Address: _____
Phone: Home _____ Work _____ Cell _____

Technical Skills Journeyman Assessor/s

Name: _____ Business Name: _____
Phone: Home: _____ Work: _____ Cell: _____ Business Address: _____
Email Address: _____

Name: _____ Business Name: _____
Phone: Home: _____ Work: _____ Cell: _____ Business Address: _____
Email Address: _____

Name: _____ Business Name: _____
Phone: Home: _____ Work: _____ Cell: _____ Business Address: _____
Email Address: _____

Apprenticeship Program Start Date _____ Completion Date: _____ Red Seal Certification Date _____

Apprenticeship Training Officer:

Signature: _____

Provincial/Territorial Apprenticeship Manager:

Signature: _____

Province/Territory: _____

Professional Skills Record (PSR) Development

Professional Skills Record (PSR)

The Professional Skills Record (PSR) is designed as a tool of assessment. Learning and skills are validated through the PSR when they are signed-off by a journeyperson in the trade in which the apprenticeship is being served.

All skills and learning assessed in this PSR are measured against the standards listed in the National Occupational Analysis (NOA). The NOA is recognized by the Canadian Council of Directors of Apprenticeship (CCDA) as the national standard for the occupation of Industrial Electrician.

PSR Industrial Electrician Document Validation

To conduct a reliable assessment through a formal recognition process, skills and learning statements must be measurable. To assess skills and learning using a PSR in the trades, the Knowledge, Skills and Abilities listed in the NOA have been made into measurable competency statements by adding an “action word.” This action word describes the skill and learning level which must be reached by an apprentice on the job in order to meet industry standards. Each PSR has been validated by a trades team, all of whom hold a Certificate of Qualification with Red Seal endorsement, and who reached consensus on each action word used in every knowledge, skill and ability statement.

Where Technical Trade Learning Happens

This Professional Skills Record (PSR) records and recognizes directly related trade technical skills and knowledge learned through:

- **Formal Learning** – structured learning that occurs in formal education and training institutions (for example, high school, trades school, apprenticeship programs, registered union and industry training programs)
- **Non-formal Learning** – learning that happens through planned, structured training or education outside the formal education system (for example, workshops, seminars, community school)
- **Informal/Experiential Learning** – learning that results from experience, occurs outside a structured environment, and is controlled by the learner (for example, experience on-the-job, volunteer work, self-study and life experiences). Informal or experiential learning must be current and essential to the trade.

Definitions: Adopted and/or interpreted from Work-related Informal Learning: Research and Practice in the Canadian Context, CAPLA 2008

Academic Trade Requirement

Trade Designation: Industrial Electrician National Occupational Classification (NOC) 7242

One of the following prerequisites must be met before writing the Interprovincial Red Seal exam: an academic Grade 12 certificate or a General Education Diploma (GED) or successful assessment in the following Essential Skills.

Essential Skills common to all trades are listed in Appendix B of this document. Specific Essential Skills for the Industrial Electrician trade are listed on the Red Seal website: www.red-seal.ca. (Once on that site, you will find the Essential Skills Profiles under “National Occupational Analysis.”)

A document can prove valuable learning that is recognized by industry and learning institutions.
Record and save every document earned in industry, trade school or union.

Document Record							
Document Name	Issued By	Place Issued	Date Issued	Evidence of recognition for:			Recognition Awarded
				Block/s <u>Learning Category/s</u> Completed	Task/s <u>Learning Outcome/s</u> Completed	Academic Requirement	

Prior Learning Assessment and Recognition (PLAR). . . Recognition for Skills and Learning (RSL)

PLAR is a formal recognition process in which a variety of tools are used to help people identify, demonstrate and receive recognition for skills and learning they have from the workplace, educational institutions, credentialing organizations or regulatory bodies.

The **Professional Skills Record (PSR)** is a tool designed to assist a trades apprentice to record skills and learning, and then receive recognition for the skills and learning through a PLAR trades process called:

RECOGNITION FOR SKILLS AND LEARNING (RSL)

Traditionally, 80% of learning in a trade happens in the workplace. Through a **Recognition for Skills and Learning (RSL)** process, an apprentice can advance in a trade when they prove they have the required hours, skills and learning for that trade. Proof of skills and learning is **recorded** by the apprentice in a **PSR** and **verified** when signed-off by a journeyman in that trade.

Through the completion of a **PSR**, an apprentice can avoid relearning what they already know and can do. Through an **RSL** process, a trade apprentice can submit a PSR for assessment to:

- advance in Block/Period/Level in-school training by not having to complete a Block/Period/Level in which proof is provided that skills and learning have already been achieved for that Block/Period/Level.
- transfer common skills from one trade to another - **Skills and learning must be transferred prior to writing the Interprovincial Red Seal exam. The same skills and learning cannot be recognized toward certification in two trades.**
- compare skills and learning in a trade from another country to Canadian standards (**as stated in the National Occupational Analysis**) and receive recognition for the skills and learning that meet Canadian standards.

The following assessment indicators (Rating, Proof, Use) have been developed to help record and then assess skills and learning in accordance with the standards of the trade outlined in the National Occupational Analysis (NOA).

Assessment Standard ONE		
Rating: Self-assessment performance rating in the workplace		
Workplace Performance	Rating	Examples of Workplace position/s
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to meet or shorten task timelines - beyond the expected level and quality of performance required by industry - can manage, lead and train others to perform this task and series of sub-tasks 	6	Journeyman with a Certificate of Qualification, Red Seal endorsement and/or Gold Seal tradesperson who is an expert in their field <ul style="list-style-type: none"> - Project Manager/Foreman - Highly skilled and experienced Manager/Supervisor - Expert who comes from industry to serve as an instructor in a trades training program
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to meet or shorten task timelines - to the highest level and quality of performance required by industry - take the initiative to respond to unexpected situations when they arise and supervise others 	5	Highly skilled and experienced journeyman with a Certificate of Qualification, Red Seal endorsement to whom co-workers turn for direction and help
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to meet task timelines - to the highest level and quality required by industry without supervision 	4	Experienced, skilled journeyman with a Certificate of Qualification, Red Seal endorsement
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to the level and quality required by industry without assistance or supervision 	3	Newly certified journeyman with a Certificate of Qualification, Red Seal endorsement
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to the required level and quality of performance with direction, some assistance and supervision 	2	Apprentice working under the direction of a journeyman with a Certificate of Qualification, Red Seal endorsement
Can perform this task and series of sub-tasks: <ul style="list-style-type: none"> - to the required level and quality of performance with assistance and constant supervision 	1	A helper or new apprentice who must work directly under the constant supervision of a journeyman with a Certificate of Qualification, Red Seal endorsement

Proof: Self-assessment options to prove skills and learning have been achieved

Type of Proof – Observation ... Interview ... Documentation

Observation

When you choose “Observation” to prove that you can perform a task, the person who verifies your work must be Red Seal Certified in the trade in which you are an apprentice.

Interview

When you choose “Interview” to prove that you can perform the task, the person who verifies your work must be Red Seal Certified in the trade in which you are an apprentice. In the case of a panel, at least one person on the panel must be Red Seal Certified in the trade in which you are an apprentice.

Documentation

When you choose “Documentation” to prove that you can perform a task, the document must be from a certified training school or from an industry training course. Course content must be part of the requirements of your trade. If the document is from another country, it must be verified as equivalent to Canadian requirements in the trade.

NOTE: Gather all your documents and keep them with your PSR.

Assessment Standard THREE

Use: Self-assessment rating to help make a plan for additional learning and skill updates needed to be successful in achieving goals in a trade

Use of Knowledge, Skills and Abilities – 1 Daily 2 Often 3 Seldom 4 Never

Show how often you use a skill. This will help you to know:

- ◆ what skills you do well because you do them on a regular basis
- ◆ what skills you have to update if you want to transfer to another employer or move to another province or territory
- ◆ what skills you have to get from a training school, industry program or other employer

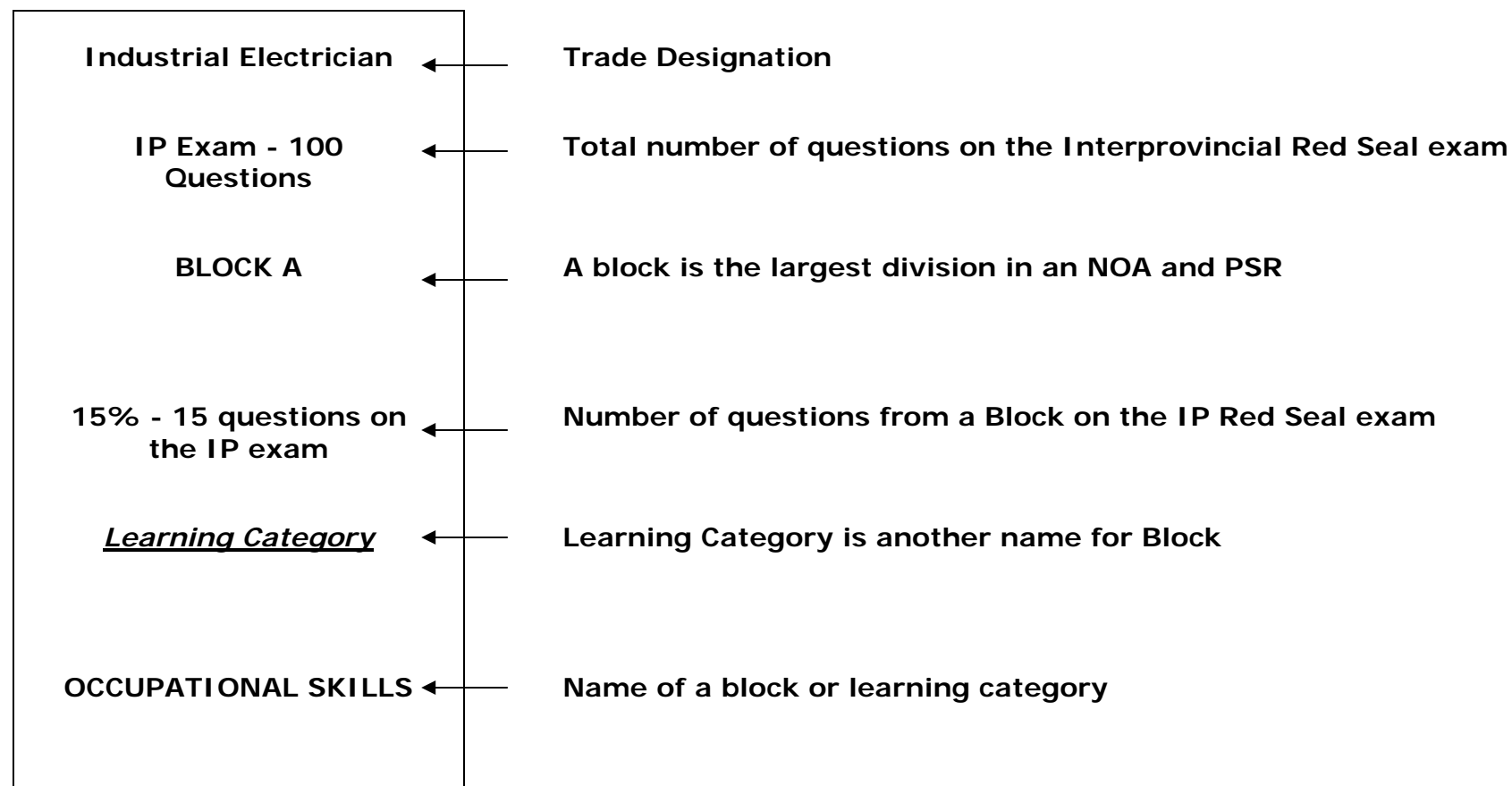
Completing this PSR can help you:

- ◆ know the full scope of your trade by exploring all the technical skills in your trade
- ◆ highlight the skills you already have
- ◆ identify any gaps that you may have to fill so you can be successful in writing your Interprovincial Red Seal certification exam
- ◆ create a plan you can follow to fill these technical skills gaps

Professional Skills Record (PSR) Components

Information from the National Occupational Analysis (NOA) is the foundation document for the Professional Skills Record (PSR). The PSR has been designed so that information is easily found to help a trade apprentice take control and direct his/her own individual skills and learning path.

Information in the PSR includes:



Professional Skills Record (PSR) Components (cont'd)

Task 1 – A

3 questions on the IP exam

Learning Outcome

Uses and maintains tools and equipment

- ← Task Number and Block/Category (letter number)
- ← Number of questions on the IP Red Seal exam from the task
- ← Learning Outcome is another name for a task
- ← Task or learning outcome description

Journeyperson Sign-off Task 1

Complete

Incomplete

- ← Journeyperson’s initials verify that an apprentice can perform the task to industry standards.
- ← Journeyperson’s initials indicate “incomplete” when the apprentice requires more work because the task is not being performed to industry standards.

Professional Skills Record (PSR) Set-up (cont'd)

Task 1
Learning Needs

Sub-Tasks
Learning Objectives

To be completed
 Comments

Journeyman lists any Sub-Tasks (Learning Objectives that an apprentice must improve before they can have their Task (Learning Outcome) signed off).



When completed, this column becomes a learning plan for the apprentice.

Sub-Task
1.02

Learning Objective

Maintains portable power tools

JP Sign-off _____

← Sub-Task Number

← Learning Objective is another name for sub-task

← Sub-task or learning objective description

← Journeyman assesses and signs off when the apprentice can perform a sub-task or learning objective to industry standard

How to Self-Assess Skills and Learning Using a PSR

For easier use, the self-assessment charts have been shortened into an assessment key which is located at the top of each two-page section in a PSR. The "3" rating is considered "Industry Standard."

- RATING:**
- 6 - Expert perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

TYPE OF PROOF: O - Observation I - Interview D - Documentation

USE: 1 - Daily 2 - Often 3 - Seldom 4 - Never

How to Record Skills and Learning Using a PSR

Self-assessment takes place where the learning of skills takes place in each of the Knowledge, Skills and Abilities. (Knowledge, Skills and Abilities can also be called Competencies).

1.02.01

Identify types and functions of air, electric and hydraulic portable power tools

← Skill and Learning that must meet industry standard.

Rating 5

← Choose and insert a number from the RATING key that best describes your level of performance in the workplace.

Proof I

← Choose and insert a letter from the PROOF key that indicates your best choice to provide proof that you have this knowledge, skill and ability in the trade.

Use 2

← Choose and insert a number from the USE key that indicates how often you use the knowledge, skills and ability (competency).

Complete



← Insert a check mark in the box to indicate completion of the competency to industry standard.

Tips to making sure you get recognition for all your skills and learning:

- take your **time** when you are working on your PSR
- do not try to complete **too much** at any one time
- be **fair and honest** with yourself; remember, this is a **self-assessment** tool
- **focus** on each task (*learning outcome*) and sub-task (*learning objective*)

**Industrial Electrician
IP Exam - 100 Questions**

BLOCK A
15% -15 Questions
on the IP exam

Learning Category
OCCUPATIONAL SKILLS

Task 1 - A
3 questions on the IP exam

Learning Outcome
**Uses and maintains tools
and equipment**

Journeyperson
Sign-off
Task 1

Complete

Incomplete

**Task 1
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

- O - Observation
- I - Interview
- D - Documentation

Use:

- 1 - Daily
- 2 - Often
- 3 - Seldom
- 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 1.01 <u>Learning Objective</u> Maintains hand tools JP Sign-off ____	1.01.01 Identify, select and use all types of hand tools such as screwdrivers, pliers, wrenches and measuring tapes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.02 Recognize tool limitations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.03 Organize and store hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.04 Clean, lubricate and adjust hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.01.05 Recognize worn, damaged or defective hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	SUB-TASK 1.02 <u>Learning Objective</u> Maintains portable power tools JP Sign-off ____	1.02.01 Identify types and functions of air, electric and hydraulic portable power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.02 Recognize capabilities and limitations of air, electric and hydraulic power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.03 Follow operating procedures of air, electric and hydraulic portable power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.04 Organize and store portable power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	1.02.06 Change portable power tool components such as checks, bits and blades Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.07 Recognize worn, damaged or defective portable power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.08 Replace power tool components such as cords, attachment plugs and air lines Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.02.09 Repair electrical portable power tools to Original Equipment Manufacturers' (OEM) specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

**Task 1 - A
(cont'd)**
Learning Outcome
**Utilizes and maintains tools
and equipment**

**Task 1
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 1.03 <u>Learning Objective</u> Maintains stationary power tools JP Sign-off ____	1.03.01 Identify types and functions of stationary power tools such as drill presses, bench grinders and belt sanders Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.02 Follow procedures of stationary power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.03 Recognize capabilities and limitations of stationary power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.04 Organize and store stationary power tool components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.05 Clean, lubricate and adjust stationary power tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	1.03.06 Recognize worn, damaged or defective stationary power tool components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.03.07 Change components such as chucks, bits, blades and belts Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 1.04 <u>Learning Objective</u> Maintains powder- actuated tools JP Sign-off ____	1.04.01 Identify types and functions of powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.02 Determine fastener specifications for powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.03 Determine training and certification requirements to operate powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.04 Follow manufacturers' operating and maintenance instructions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.05 Recognize capabilities and limitations of powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	1.04.06 Identify powder-actuated tool components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.07 Organize powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.08 Disassemble, clean and lubricate powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.09 Store powder-actuated tools and shots Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.10 Dispose of shots Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	1.04.11 Recognize worn, damaged or defective powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.04.12 Recognize hazards associated with powder-actuated tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 1 - A
(cont'd)**
Learning Outcome
Utilizes and maintains tools and equipment

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

**Task 1
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

<p>SUB-TASK 1.05</p> <p><u>Learning Objective</u> Maintains mechanical measuring equipment</p> <p>JP Sign-off _____</p>	<p>1.05.01 Identify types of mechanical measuring equipment such as micrometers, torque wrenches and feeler gauges</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.05.02 Follow manufacturers' specifications regarding calibration schedules</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.05.03 Follow operating procedures for mechanical measuring equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.05.04 Organize and store mechanical measuring equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.05.05 Ensure calibration of mechanical measuring equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>1.05.06 Recognize worn, damaged or defective mechanical measuring equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				
<p>SUB-TASK 1.06</p> <p><u>Learning Objective</u> Maintains electrical testing and diagnostic tools</p> <p>JP Sign-off _____</p>	<p>1.06.01 Identify types and functions of electrical testing and diagnostic tools such as multimeters, voltage testers, non-contact voltage testers, insulation resistance meters and clamp ammeters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.02 Determine applications of electrical testing and diagnostic tools</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.03 Recognize limitations and ratings of electrical testing and diagnostic tools</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.04 Identify electrical testing and diagnostic tools components such as leads, fuses and batteries</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.05 Identify electrical testing and diagnostic tools accessories</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>1.06.06 Recognize environmental factors that affect readings</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.07 Recognize OEM specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.08 Follow calibration schedules</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.09 Organize and store electrical testing and diagnostic tools</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.06.10 Recognize worn, damaged or defective electrical testing and diagnostic tools</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 1 - A
(cont'd)**
Learning Outcome
**Utilizes and maintains tools
and equipment**

**Task 1
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 1.07</p> <p><u>Learning Objective</u> Uses scaffolding and access equipment</p> <p>JP Sign-off _____</p>	<p>1.07.01 Identify types of access equipment such as scissor lifts, platform lifts and articulated boom lifts</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.02 Identify types of scaffolding such as tubular and frame</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.03 Recognize capabilities and limitations of scaffolding and access equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.04 Recognize load bearing capacity of access equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.05 Comply with certification requirements for scaffolding and access equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>1.07.06 Follow fall protection requirements when working on access equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.07 Demonstrate an understanding of safe angles of ladders</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.08 Demonstrate an understanding of and follow the three-point contact rule</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.09 Follow regulations regarding the use of scaffolding and access equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.10 Assess work site surroundings such as trenching, pits and overhead hazards</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>1.07.11 Set up step ladders and extension ladders</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.12 Work from access equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.13 Erect various types of scaffolding</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.07.14 Recognize unsafe, worn, damaged or defective scaffolding and access equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 1.08</p> <p><u>Learning Objective</u> Uses rigging, tugging, hosting and lifting equipment</p> <p>Continued next page</p>	<p>1.08.01 Identify types and functions of rigging, tugging, hosting and lifting equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.02 Comply with certification requirements regarding rigging, tugging, hosting and lifting equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.03 Follow operating procedures and techniques of rigging, tugging, hosting and lifting equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.04 Recognize limitations of rigging, tugging, hosting and lifting equipment such as angles, loads and weights</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.05 Demonstrate an understanding of anchor points</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>1.08.06 Demonstrate an understanding of load ratings</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.07 Use and understand hand signals</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.08 Select rigging, hosting and lifting equipment according to application</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.09 Secure load</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.08.10 Clean, lubricate and store rigging, tugging, hosting and lifting equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 1 - A
(cont'd)**

Learning Outcome
**Utilizes and maintains tools
and equipment**

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
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Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

**Task 1
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

SUB-TASK 1.08 Continued <u>Learning Objective</u> Uses rigging, tugging, hosting and lifting equipment JP Sign-off ____	1.08.11 Recognize worn, damaged or defective rigging, tugging, hosting and lifting equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.08.12 Perform minor field repairs and replenish fluid levels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				
SUB-TASK 1.09 <u>Learning Objective</u> Uses computer systems JP Sign-off ____	1.09.01 Identify types and functions of computer systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.09.02 Identify capabilities and computer systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.09.03 Identify computer operating systems and networking requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.09.04 Demonstrate a working knowledge of software such as word processors, databases, e-mail, Internet browsers, maintenance management and inventory control Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.09.05 Identify and select computer components and accessories such as scanners, printers and cables Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	1.09.06 Perform common operations on computers such as saving, searching, deleting, and creating and modifying documents Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.09.07 Input data to manufacturer's software Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.09.08 Research documentation such as manufacturers' specifications, manuals, codes and regulations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	1.09.09 Download and upload email and digital images on computers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 1 - A
(cont'd)**
Learning Outcome
**Utilizes and maintains tools
and equipment**

**Task 1
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 1.10 <u>Learning Objective</u> Uses personal protective equipment (PPE) and safety equipment JP Sign-off _____</p>	<p>1.10.01 Identify and select types of PPE such as hard hats, safety glasses, safety footwear, insulating gloves, and fall arrest and respiratory protection equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.02 Identify types of safety equipment such as first aid kits, fire extinguishers and eye wash stations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.03 Follow certification and training requirements for PPE and safety equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.04 Demonstrate an understanding of types and operation of fire extinguishing equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.05 Identify location of PPE and safety equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>1.10.06 Recognize shelf life of PPE and safety equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.07 Select PPE according to task</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.08 Follow Workplace Hazardous Material Information System (WHMIS) procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.09 Recognize limitations of use of PPE and safety equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.10 Organize and store PPE and safety equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>1.10.11 Recognize worn, damaged or defective PPE and safety equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>1.10.12 Locate PPE and safety equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			

Task 2 - A
4 questions on the IP exam

Learning Outcome
Organizes work

Journeyperson
Sign-off
Task 2

Complete

Incomplete

Task 2
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
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Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.01 <u>Learning Objective</u> Interprets codes and regulations JP Sign-off ____	2.01.01 Demonstrate an understanding of and follow codes such as building codes, the Canadian Electrical Code (CEC) and jurisdictional codes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.02 Demonstrate an understanding of and follow Occupational Health and Safety (OH&D) regulations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.03 Demonstrate an understanding of and follow standards such as Canadian Standards Association (CSA) and Underwriters Laboratory Canada (ULC) Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.04 Access code and regulation updates Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.01.05 Access and apply codes and regulations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	SUB-TASK 2.02 <u>Learning Objective</u> Interprets plans, schematics, drawings and specifications JP Sign-off ____	2.02.01 Recognize components of plans, drawings and specifications such as scale, legend, details, abbreviations and symbols Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.02 Cross reference plans, drawings and specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.03 Locate information on plans, drawings and specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.04 Scale dimensions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.02.06 Perform mathematical calculations such as conduit fill, and single- and three-phase electrical circuit parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.07 Understand schematics and wiring diagrams Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.02.08 Determine whether drawings are up-to-date Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 2 - A
(cont'd)**
Learning Outcome
Employs tools and equipment

**Task 2
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.03 <u>Learning Objective</u> Modifies drawings and schematics JP Sign-off ____	2.03.01 Recognize components of plans, schematics, drawings and specifications such as scale, legend and details Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.03.02 Use standard symbols and drawing conventions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.03.03 Use computer assisted drawing (CAD) systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.03.04 Demonstrate an understanding of documentation requirements for modifying drawings Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.03.05 Cross reference plans, drawings and specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	2.03.06 Locate information on plans, drawings and specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.03.07 Scale dimensions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.03.08 Understand schematics and wiring diagrams Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.03.09 Document changes made to equipment and wiring Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 2.04 <u>Learning Objective</u> Uses documentation and reference material JP Sign-off ____	2.04.01 Demonstrate an understanding of types of documentation such as manuals, work orders, preventative maintenance sheets, regulations, technical bulletins, shop drawings and catalogues Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.02 Use standard symbols and conventions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.03 Follow company policies and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.04 Follow OH&S regulations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.05 Demonstrate an understanding of WHMIS symbols and Material Safety Data Sheets (MSDS) Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	2.04.06 Demonstrate an understanding of OEM specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.07 Locate documentation and reference material using computers, files, prints, reference manuals and websites Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.08 Use schematics to troubleshoot Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.09 Complete work-related documents such as as-built drawings, work orders, log books and time sheets Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.10 Fill out safety documentation such as hazard assessments, tool box talk records and first aid logs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	2.04.11 Compile data using documents and digital pictures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.04.12 Transfer information and pictures electronically Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 2 - A
(cont'd)**

Learning Outcome
Employs tools and equipment

**Task 2
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
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Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.05 <u>Learning Objective</u> Communicates with others JP Sign-off ____	2.05.01 Demonstrate an understanding of and correctly use trade terminology Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.05.02 Communicate identified hazards Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.05.03 Communicate with supervisors and other electricians Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.05.04 Coordinate work with other trades Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.05.05 Participate in safety and information meetings Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.05.06 Communicate with laypersons Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.05.07 Communicate with engineers and architects Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.05.08 Mentor apprentices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 2.06 <u>Learning Objective</u> Compiles a list of materials and supplies JP Sign-off ____	2.06.01 Identify project or task to be completed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.06.02 Recognize site conditions and restrictions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.06.03 Research available materials Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.06.04 Identify required materials and supplies according to plans and specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.06.05 Perform mathematical calculations such as scaling, ratios and determining segment lengths of cabling and wiring Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.06.06 Interpret site measurements and instructions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.06.07 Quantify materials according to plans Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.06.08 Do inventory control Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 2 - A
(cont'd)**

Learning Outcome
Employs tools and equipment

**Task 2
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.07 <u>Learning Objective</u> Plans project tasks and procedures JP Sign-off ____	2.07.01 Research delivery dates, inventory control and availability of materials Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.07.02 Demonstrate an understanding of sequence of operations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.07.03 Establish and maintain schedules Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.07.04 Determine labour and equipment requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.07.05 Coordinate work with other trades such as shutdown requirements and installation sequencing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	2.07.06 Apply specifications such as wire sizes, load requirements and locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.07.07 Draw and sketch layouts Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.07.08 Give and follow directions and instructions Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	2.07.09 Follow installation and operational sequences Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

Task 3 - A
3 questions on the IP exam

Learning Outcome
Performs routine activities

Journeyperson
 Sign-off
 Task 3

Complete

Incomplete

Task 3
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 3.01 <u>Learning Objective</u> Prepares work site JP Sign-off ____	3.01.01 Identify work site location Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.02 Identify building structures such as walls, ceilings and floors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.03 Identify equipment such as panel boards, switchgear and motor control centres (MCC) Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.04 Demonstrate an understanding of work site hazards such as existing utilities, dust, temperature, chemicals and weather Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.05 Perform a visual inspections of the work area Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	3.01.06 Perform pre-job safety assessment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.07 Control site access Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.08 Create openings and penetrations in structures and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.01.09 Lay out job materials and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 3.02 <u>Learning Objective</u> Maintains safe work environment JP Sign-off ____	3.02.01 Follow OH&S and WHMIS Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.02 Demonstrate an understanding of workers' rights and responsibilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.03 Follow company and site safety policies and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.04 Follow site-specific fire safety and work permit procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.05 Follow emergency procedures such as for evacuation, fire and hazardous chemical alarms Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	3.02.06 Identify location of on-site first aid stations and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.07 Recognize and report potential hazards Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.08 Test radiation sources using measurement instruments such as Geiger counters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.02.09 Perform housekeeping practices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

**Task 3 - A
(cont'd)**

Learning Outcome
Demonstrates work practices and procedures

**Task 3
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

Knowledge, Skills and Abilities - Competencies

SUB-TASK 3.03 <u>Learning Objective</u> Conducts operational tests JP Sign-off _____	3.03.01 Demonstrate an understanding of and follow start-up and commissioning procedures such as rotational testing, voltage readings and current readings Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.02 Complete required documentation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.03 Follow OEM specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.04 Demonstrate an understanding of sequence of operation of equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.05 Select and use operational testing tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	3.03.06 Perform visual inspections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.07 Adjust equipment to specifications such as motor overload protection and adjustable trip mechanism circuit breakers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.08 Ensure sequencing and safety circuit operation after modifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	3.03.09 Perform full function test Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

Task 4 - A
5 questions on the IP exam

Learning Outcome
Performs trade-specific activities

Journeyperson
 Sign-off
 Task 4

Complete

Incomplete

Task 4
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

- O - Observation
- I - Interview
- D - Documentation

Use:

- 1 - Daily
- 2 - Often
- 3 - Seldom
- 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 4.01 <u>Learning Objective</u> Installs fasteners, fittings and connectors JP Sign-off ____	4.01.01 Identify types, styles, purposes and sizes of fasteners, fittings and connectors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.02 Follow installation procedures of fasteners, fittings and connectors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.03 Identify specific uses of fasteners, fittings and connectors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.04 Recognize capabilities and limitations of fasteners, fittings and connectors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.05 Follow replacement procedures and techniques for fasteners, fittings and connectors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	4.01.06 Demonstrate an understanding of torque limits Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.07 Select and use fasteners, fittings and connectors appropriate to the task and environment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.08 Torque fasteners, fittings and connectors to specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.09 Store fasteners, fittings and connectors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.01.10 Lubricate and apply sealant to fasteners, fittings and connectors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 4.02 <u>Learning Objective</u> Performs lock-out and tagging procedures JP Sign-off ____	4.02.01 Demonstrate an understanding of lock-out and tagging procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.02 Meet training requirements for lock-out and tagging Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.03 Identify system components that require lock-out and tagging Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.04 Comply with site documentation requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.05 Coordinate lock-out and tagging requirements with appropriate authorities and other trades Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	4.02.06 Recognize equipment for tagging Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.07 Locate and de-energize appropriate equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.08 Select approved equipment to ensure proper lock-out and tagging Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.09 Verify proper lock-out and tagging Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.02.10 Implement lock-out and tagging procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 4 - A
(cont'd)**

Learning Outcome
Performs trade-specific activities

Task 4

Learning Needs

Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 4.03</p> <p><u>Learning Objective</u> Installs electrical wiring, cabling and terminations</p> <p>JP Sign-off _____</p>	<p>4.03.01 Identify of types and functions of electrical wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.02 Recognize capabilities and limitations of electrical wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.03 Follow installation procedures and techniques for electrical wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.04 Follow high voltage cabling and termination procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.05 Determine sizes of electrical wires and cables</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>4.03.06 Follow termination procedures with dissimilar metals</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.07 Follow regulations regarding the installation of electrical wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.08 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.09 Install, route and secure electrical wiring and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.10 Cut and crimp electrical wiring and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>4.03.11 Torque terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.12 Check for continuity and insulation of electrical wires and cables</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.03.13 Label, verify and record installation of electrical wiring and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

**Task 4 - A
(cont'd)**

Learning Outcome
Performs trade-specific activities

**Task 4
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

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4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

3 - Complete a task to the level and quality of performance required by industry without assistance or supervision

2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 4.04 <u>Learning Objective</u> Maintains electrical wiring, cabling and terminations JP Sign-off _____	4.04.01 Identify types and functions of electrical wiring, cabling and terminations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.02 Recognize capabilities and limitations of electrical wiring, cabling and terminations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.03 Follow installation procedures and techniques for electrical wiring, cabling and terminations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.04 Follow high voltage cabling and termination procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.05 Determine sizes of electrical wires and cables Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	4.04.06 Follow termination procedures with similar metals Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.07 Follow regulations regarding the maintenance of electrical wiring, cabling and terminations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.08 Select and use tools and equipment to locate and repair abnormalities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.09 Perform visual inspections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	4.04.10 Locate loose terminations and overheating points Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	4.04.11 Verify the ampacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____					

**Task 4 - A
(cont'd)**

Learning Outcome
Performs trade-specific activities

**Task 4
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 4.05</p> <p><u>Learning Objective</u> Installs communication and intercommunication wiring, cabling and terminations</p> <p>JP Sign-off _____</p>	<p>4.05.01 Identify types and functions of communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.02 Recognize capabilities and limitations of communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.03 Follow installation procedures and techniques for communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.04 Determine sizes of communication and intercommunication wires and cables</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.05 Follow termination procedures with dissimilar metals</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>4.05.06 Follow regulations regarding the installation of communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.07 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.08 Install, route and secure communication and intercommunication wiring and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.09 Cut and crimp communication and intercommunication wiring and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.10 Torque terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>4.05.11 Check for continuity and insulation of communication and intercommunication wires and cables</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.05.12 Label, verify and record installation of communication and intercommunication wiring and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			
<p>SUB-TASK 4.06</p> <p><u>Learning Objective</u> Maintains communication and intercommunication wiring, cabling and terminations</p> <p>JP Sign-off _____</p>	<p>4.06.01 Identify types and functions of communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.02 Recognize capabilities and limitations of communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.03 Follow installation procedures and techniques for communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.04 Determine sizes of communication and intercommunication wires and cables</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.05 Follow termination procedures with dissimilar metals</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>4.06.06 Follow regulations regarding the maintenance of communication and intercommunication wiring, cabling and terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.07 Select and use tools and equipment to locate and repair abnormalities</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.08 Perform visual inspections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.09 Locate loose terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.06.10 Verify ampacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 4 - A
(cont'd)**

Learning Outcome
Performs trade-specific activities

**Task 4
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
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 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 4.07</p> <p><u>Learning Objective</u> Installs raceways, cable trays, busways and associated components</p> <p>JP Sign-off _____</p>	<p>4.07.01 Identify types and functions of raceways, cable trays, busways and associated components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.07.02 Recognize capabilities and limitations of raceways, cable trays, busways and associated components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.07.03 Follow installation procedures and techniques for raceways, cable trays, busways and associated components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.07.04 Use proper bending techniques for conduit applications including rigid, electrical metallic tubing (EMT) and polyvinyl chloride (PVC)</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.07.05 Use proper supporting and securing methods for raceways, cable trays, busways and associated components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>4.07.06 Perform fire stopping techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.07.07 Perform mathematical calculations such as scaling, ratios and installation trigonometry</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.76.08 Select and size raceways, cable trays, busways and associated components according to code, standards and manufacturers' specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.07.09 Lay out positions of raceways, cable trays, busways and associated components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.07.10 Select fittings according to the installation environment such as weather-tight, dust-tight and rain-tight fittings</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
<p>SUB-TASK 4.08</p> <p><u>Learning Objective</u> Maintains seismic restraint systems (NOT COMMON CORE)</p> <p>JP Sign-off _____</p>	<p>4.08.01 Follow jurisdiction regulations regarding seismic restraint systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.08.02 Demonstrate an understanding of types of seismic restraint systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>4.08.03 Select and use applicable methods to secure components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

Industrial Electrician

BLOCK B

15% -15 Questions on the IP exam

Learning Category

WIRING AND LIGHTING SYSTEMS

Task 5 - B

4 questions on the IP exam

Learning Outcome

Maintains lighting systems

Journeyperson

Sign-off

Task 5

Complete

Incomplete

Task 5 Learning Needs

Sub-Tasks

Learning Objectives to be completed

Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 5.01 <u>Learning Objective</u> Installs lighting systems JP Sign-off ____	5.01.01 Demonstrate an understanding of regulations regarding the installation of lighting systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.02 Identify types of lighting systems such as HID, fluorescent and incandescent Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.03 Identify lighting system components such as ballasts, lamps and igniters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.04 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.05 Follow installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	5.01.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.07 Assemble lighting components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.08 Locate and mount lighting components in appropriate location Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.01.09 Verify operation of lighting system Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 5.02 <u>Learning Objective</u> Inspects lighting systems JP Sign-off ____	5.02.01 Demonstrate an understanding of types of lighting systems such as HID, fluorescent and incandescent Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.02 Identify lighting system components and controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.03 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.04 Follow inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.05 Verify lighting specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	5.02.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.07 Perform sensory inspections of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.08 Recognize worn, damaged or defective components such as leaking ballast and burnt wiring Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.09 Identify hazards such as dust build-up, heat and moisture Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.02.10 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 5 - B
(cont'd)**

Learning Outcome
Maintains lighting systems

**Task 5
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
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Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 5.03 <u>Learning Objective</u> Troubleshoots lighting systems JP Sign-off ____	5.03.01 Demonstrate an understanding of types of lighting systems such as HID, fluorescent and incandescent Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.02 Demonstrate an understanding of lighting system components and controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.03 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.04 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.05 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	5.03.06 Demonstrate troubleshooting procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.08 Isolate faults in lighting systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.09 identify faulty components such as lamps, ballasts and controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	5.03.10 Disassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	5.03.11 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 5 - B
(cont'd)**

Learning Outcome
Maintains lighting systems

**Task 5
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 5.04</p> <p><u>Learning Objective</u> Repairs lighting systems</p> <p>JP Sign-off _____</p>	<p>5.04.01 Demonstrate an understanding of types of lighting systems such as HID, fluorescent and incandescent</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.02 Demonstrate an understanding of system components and controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.03 Demonstrate an understanding of component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.04 Demonstrate repair procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>5.04.06 Determine whether components require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.07 Select replacement components based on type, size and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.08 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.09 Locate and mount lighting components in appropriate locations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>5.04.10 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>5.04.11 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				

Task 6 - B
7 questions on the IP exam

Learning Outcome
Maintains alternating current (AC) systems

Journeyperson
 Sign-off
 Task 6

Complete

Incomplete

Task 6
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
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 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 6.01 <u>Learning Objective</u> Installs AC systems JP Sign-off ____	6.01.01 Demonstrate an understanding of regulations regarding the installation of AC systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.02 Identify types of AC systems such as single- and three-phase Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.03 Identify AC system components, controls and capabilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.04 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.05 Demonstrate installation procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	6.01.06 Demonstrate an understanding of load balancing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.07 Demonstrate an understanding of power factor correction Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.08 Demonstrate an understanding of line and low voltage controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.09 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.10 Assemble AC system components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	6.01.11 Determine circuit loading capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.12 Locate and mount AC system components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.01.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 6 - B
(cont'd)**

Learning Outcome
Maintains alternating current (AC) systems

**Task 6
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 6.02</p> <p><u>Learning Objective</u> Inspects AC systems</p> <p>JP Sign-off _____</p>	<p>6.02.01 Demonstrate an understanding of types of AC systems such as single- and three-phase</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.02 Identify AC system components, controls and capabilities</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.03 Demonstrate an understanding of component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.04 Demonstrate inspection procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.05 Verify AC systems specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>6.02.06 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.07 Perform sensory inspections of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.08 Recognize worn, damaged or defective components such as blown fuses, burnt wiring and hot spots</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.09 Identify hazards such as dust build-up, heat and moisture</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.02.10 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>6.02.11 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				

**Task 6 - B
(cont'd)**

Learning Outcome
Maintains DC systems

**Task 6
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 6.03 <u>Learning Objective</u> Troubleshoots AC systems JP Sign-off ____	6.03.01 Demonstrate an understanding of types of AC systems such as single- and three-phase Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.02 Demonstrate an understanding of specifications for troubleshooting Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.03 Demonstrate an understanding of AC system components, controls and capabilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.04 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.05 Demonstrate troubleshooting procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	6.03.06 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.07 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.08 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.09 Isolate faults in AC systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.10 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	6.03.11 Identify faulty components such as fuses, breakers and contactors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.12 Disassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.03.13 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 6 - B
(cont'd)**

Learning Outcome
Maintains DC systems

**Task 6
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 6.04</p> <p><u>Learning Objective</u> Repairs AC systems</p> <p>JP Sign-off _____</p>	<p>6.04.01 Demonstrate an understanding of types of AC systems such as single- and three-phase</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.02 Demonstrate an understanding of AC system components, controls and capabilities</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.03 Demonstrate an understanding of component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.04 Demonstrate repair procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>6.04.06 Determine whether components require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.07 Select replacement components based on type, size and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.08 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.09 Locate and mount AC components in appropriate locations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>6.04.10 Document repair performed</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>6.04.11 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				

**Task 6 - B
(cont'd)**

Learning Outcome
Maintains DC systems

**Task 6
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 6.05 <u>Learning Objective</u> Services AC systems JP Sign-off _____	6.05.01 Demonstrate an understanding of types of AC systems such as single- and three-phase Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.02 Follow OEM specifications regarding preventative maintenance schedules Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.03 Identify AC system components, controls and capabilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.04 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.05 Demonstrate preventative maintenance techniques, tests and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	6.05.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.07 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.08 Clean and lubricate components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.09 Check wiring and cable connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.10 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	6.05.11 Select replacement components based on type, size and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.12 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	6.05.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

Task 7 - B
4 questions on the IP exam

Learning Outcome
Maintains direct current (DC) systems

Journeyman
 Sign-off
 Task 7

Complete

Incomplete

Task 7
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 7.01 <u>Learning Objective</u> Installs DC systems JP Sign-off ____	7.01.01 Demonstrate an understanding of regulations regarding the installation of DC systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.02 Identify DC systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.03 Identify system components such as batteries, charging systems and inverters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.04 Identify DC system controls and capabilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.05 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	7.01.06 Follow installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.07 Determine filtering requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.08 Demonstrate an understanding of line and low voltage controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.09 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.10 Assemble DC components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	7.01.11 Determine circuit loading capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.12 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.13 Recognize hazards associated with DC systems such as clearances, tracking and gas build-up Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.01.14 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

**Task 7 - B
(cont'd)**

Learning Outcome
**Maintains direct current
(DC) systems**

**Task 7
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 7.02 <u>Learning Objective</u> Inspects DC systems JP Sign-off _____	7.02.01 Demonstrate an understanding of DC systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.02 Identify system components such as batteries, converters and rectifiers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.03 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.04 Demonstrate an understanding of inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.05 Verify OEM specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	7.02.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.07 Perform sensory inspections of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.08 Recognized worn, damaged or defective components such as blown fuses, burnt wiring and hot spots Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.09 Identify hazards such as dust build-up, heat and moisture Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.02.10 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	7.02.11 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 7 - B
(cont'd)**

Learning Outcome
Maintains direct current
(DC) systems

**Task 7
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 7.03</p> <p><u>Learning Objective</u> Troubleshoots DC systems</p> <p>JP Sign-off _____</p>	<p>7.03.01 Demonstrate an understanding of types of DC systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.02 Demonstrate an understanding of specifications for troubleshooting</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.03 Demonstrate an understanding of DC system components, controls and capabilities</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.04 Demonstrate an understanding of component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.05 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>7.03.06 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.07 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.08 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.09 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.10 Isolate faults in DC systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>7.03.11 Identify faulty components such as batteries, resistors and rectifiers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.12 Disassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.03.13 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

**Task 7 - B
(cont'd)**

Learning Outcome
**Maintains direct current
(DC) systems**

**Task 7
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 7.04 <u>Learning Objective</u> Repairs DC systems JP Sign-off _____	7.04.01 Demonstrate an understanding of DC systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.02 Demonstrate an understanding of DC system components, controls and capabilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.03 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.04 Demonstrate repair procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.05 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	7.04.06 Determine whether components require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.07 Select replacement components based on type, size and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.08 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.09 Locate and mount DC components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	7.04.10 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	7.04.11 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 7 - B
(cont'd)**

Learning Outcome
Maintains direct current
(DC) systems

**Task 7
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 7.05</p> <p><u>Learning Objective</u> Services DC systems</p> <p>JP Sign-off _____</p>	<p>7.05.01 Demonstrate an understanding of DC systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.02 Follow OEM specifications regarding preventative maintenance schedules</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.03 Identify DC system components, controls and capabilities</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.04 Demonstrate an understanding of component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.05 Demonstrate preventative maintenance techniques, tests and procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>7.05.06 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.07 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.08 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.09 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.10 Check wiring and cable connections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>7.05.11 Select replacement components based on type, size and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.12 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>7.05.13 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

Industrial Electrician

BLOCK C

16% -16 Questions on the IP exam

Learning Category
POWER DISTRIBUTION AND GENERATING SYSTEMS

Task 8 - C

3 questions on the IP exam

Learning Outcome
Maintains high voltage power distribution systems

Journeyman
 Sign-off
 Task 8

Complete

Incomplete

Task 8 Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

- O - Observation
- I - Interview
- D - Documentation

Use:

- 1 - Daily
- 2 - Often
- 3 - Seldom
- 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 8.01 <u>Learning Objective</u> Installs high voltage power systems JP Sign-off ____	8.01.01 Demonstrate an understanding of regulations regarding the installation of high voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.02 Identify types of high voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.03 Identify components such as switchgears, transformers and cabling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.04 Demonstrate an understanding of component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.05 Recognize hazards associated with high voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	8.01.06 Follow specific methods and procedures for installation high voltage power systems such as terminations, splicing and testing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.07 Follow specific safety procedures to access high voltage environments and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.08 Follow specific lock-out and tagging methods and procedures for high voltage work Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.09 Select and use specialized tools and equipment such as high voltage gloves, face shields, grounding sticks and arc flash PPE Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.10 Identify hazards of stored energy in capacitors, cabling and transformers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	8.01.11 Follow installation procedures and specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	8.01.12 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 8 - C
(cont'd)**

Learning Outcome
**Maintains high voltage
power distribution systems**

**Task 8
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 8.02</p> <p><u>Learning Objective</u> Inspects high voltage power systems</p> <p>JP Sign-off _____</p>	<p>8.02.01 Demonstrate an understanding of types of high voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.02 Identify components such as switchgears, transformers and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.03 Demonstrate an understanding of component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.04 Follow inspection procedures and specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.05 Demonstrate an understanding of safety procedures and equipment required to inspect high voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>8.02.06 Select and use non-destructive testing tools and equipment such as infrared cameras and ultra-sonic detectors</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.07 Identify hazards of stored energy in capacitors, cabling and transformers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.08 Perform visual inspections of high voltage components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.09 Recognize worn, damaged, defective or hazardous components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.02.10 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>SUB-TASK 8.03</p> <p><u>Learning Objective</u> Troubleshoots high voltage power systems</p> <p>JP Sign-off _____</p>	<p>8.03.01 Demonstrate an understanding of types of high voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.03 Identify components such as switchgears, transformers and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.04 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.05 Determine potential causes of power loss such as phase-to-phase shorts, overcurrent and under frequency</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
		<p>8.03.06 Follow specific safety procedures to access high voltage environments and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.07 Follow specifications for troubleshooting</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.08 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.09 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.10 Select and use diagnostic tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
		<p>8.03.11 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.12 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.13 Identify hazards of stored energy in capacitors, cabling and transformers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.14 Perform visual inspections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.03.15 Recognize worn, damaged, defective or hazardous components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 8 - C
(cont'd)**

Learning Outcome
**Maintains high voltage
power distribution systems**

**Task 8
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

3 - Complete a task to the level and quality of performance required by industry without assistance or supervision

2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

8.03.16
Retrieve, document and interpret test data

Rating ___ Complete
Proof ___
Use ___

<p>SUB-TASK 8.04</p> <p><u>Learning Objective</u> Repairs high voltage power systems</p> <p>JP Sign-off ___</p>	<p>8.04.01 Demonstrate an understanding of types of high voltage power systems</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.02 Demonstrate an understanding of system and component operation</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.03 Identify components such as switchgears, transformers and cabling</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.04 Follow OEM specifications for repair</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.05 Follow specific safety procedures to access high voltage environments and equipment</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>
	<p>8.04.06 Demonstrate repair, replacement and adjustment procedures and techniques</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.07 Select and use tools and equipment</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.08 Identify hazards of stored energy in capacitors, cabling and transformers</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.09 Determine whether components require repair or replacement</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.10 Select replacement components based on type, size and capacity</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>
	<p>8.04.11 Disassemble and reassemble components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.12 Locate and mount components in appropriate locations</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.13 Verify operation of components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>8.04.14 Document repair performed</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	

**Task 8 - C
(cont'd)**

Learning Outcome
Maintains high voltage power distribution systems

**Task 8
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 8.05</p> <p><u>Learning Objective</u> Services high voltage power systems</p> <p>JP Sign-off _____</p>	<p>8.05.01 Demonstrate an understanding of types of high voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.03 Identify components such as switchgears, transformers and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.04 Follow safety procedures required to service high voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.05 Follow OEM specifications for preventative maintenance</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>8.05.06 Follow preventative and predictive maintenance schedules</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.07 Demonstrate calibration procedures and techniques for components such as breakers, relays and switchgears</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.08 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.09 Identify hazards of stored energy in capacitors, cabling and transformers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.10 Retrieve, document and interpret service test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>8.05.11 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.12 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.13 Perform procedures and techniques such as adjustments, oil samplings and high voltage insulation testing</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.14 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>8.05.15 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

Task 9 - C
6 questions on the IP exam

Learning Outcome
Maintains low voltage power distribution systems

Journeyperson
 Sign-off
 Task 9

Complete

Incomplete

Task 9
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 9.01 <u>Learning Objective</u> Installs low voltage power systems JP Sign-off ____	9.01.01 Demonstrate an understanding of regulations regarding the installation of low voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.02 Identify types of low voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.03 Identify components such as disconnects, MCCs, transformers and cabling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.04 Follow installation procedures and specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.05 Demonstrate an understanding of rating and compatibility of components such as bus bars, breakers and distribution panels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	9.01.06 Identify hazards associated with low voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.08 Select replacement components according to type, size and rating Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.01.09 Verify the operation of low voltage systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 9.02 <u>Learning Objective</u> Inspects low voltage power systems JP Sign-off ____	9.02.01 Demonstrate an understanding of types of low voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.02 Identify components such as disconnects, MCCs, transformers and cabling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.03 Demonstrate an understanding of components such as bus bars, breakers and distribution panels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.04 Identify hazards associated with low voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.05 Follow inspection procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	9.02.06 Select and use testing tools and equipment such as thermal cameras, thermal sensors and multimeters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.07 Visually inspect system Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.08 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.02.09 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

**Task 9 - C
(cont'd)**

Learning Outcome
**Maintains low voltage
power distribution systems**

**Task 9
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 9.03</p> <p><u>Learning Objective</u> Troubleshoots low voltage power systems</p> <p>JP Sign-off _____</p>	<p>9.03.01 Demonstrate an understanding of types of low voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.03 Identify components such as disconnects, MCCs, transformers and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.04 Identify hazards associated with low voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.05 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>9.03.06 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.07 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.08 Select and use diagnostic tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.09 Visually inspect system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.10 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>9.03.11 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.12 Recognize worn, damaged, defective or hazardous components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.13 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.03.14 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 9.04</p> <p><u>Learning Objective</u> Repairs low voltage power systems</p> <p>Continued next page</p>	<p>9.04.01 Demonstrate an understanding of types of low voltage power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.03 Identify components such as disconnects, MCCs, transformers and cabling</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.04 Follow safety procedures required for repair</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.05 Demonstrate repair, replacement, adjustment and modification procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>9.04.06 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.07 Replace, adjust and modify components such as low voltage panels and MCCs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.08 Determine whether components require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.09 Select replacement components according to type, size and rating</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>9.04.10 Overhaul components such as motors, breakers and contactors</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 9 - C
(cont'd)**

Learning Outcome
**Maintains low voltage
power distribution systems**

**Task 9
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 9.04 Continued <u>Learning Objective</u> Repairs low voltage power systems JP Sign-off ____	9.04.11 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.04.12 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.04.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 9.05 <u>Learning Objective</u> Serves low voltage power systems JP Sign-off ____	9.05.01 Demonstrate an understanding of types of low voltage power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.02 Demonstrate an understanding of system and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.03 Identify components such as disconnects, MCCs, transformers and cabling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.04 Follow OEM specifications for preventative maintenance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.05 Follow safety procedures required for service Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	9.05.06 Follow procedures for testing and verification of low voltage power systems and components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.08 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.09 Clean and lubricate components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.10 Confirm integrity of mounted components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	9.05.11 Verify terminations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.12 identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.13 Perform adjustments Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.14 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	9.05.15 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

Task 10 - C
3 questions on the IP exam

Learning Outcome
Maintains DC power systems

Journeyman
 Sign-off
 Task 10

Complete

Incomplete

Task 10
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 10.01 <u>Learning Objective</u> Installs DC power systems JP Sign-off ____	10.01.01 Demonstrate an understanding of regulations regarding the installation of DC power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.02 Identify DC power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.03 Demonstrate an understanding of system and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.04 Identify components such as brushes, relays, breakers and bus bars Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.05 Demonstrate an understanding of characteristics, types and sizes of DC power system components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	10.01.06 Demonstrate an understanding of rating and compatibility of components such as bus bars, breakers and distribution panels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.07 Identify hazards associated with DC power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.08 Follow specifications and installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.09 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.10 Assemble DC components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	10.01.11 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.01.12 Verify operation of DC systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 10 - C
(cont'd)**

Learning Outcome
Maintains DC power systems

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

Task 10 Learning Needs

Sub-Tasks Learning Objectives
to be completed
Comments

<p>SUB-TASK 10.02</p> <p><u>Learning Objective</u> Inspects DC power systems</p> <p>JP Sign-off _____</p>	<p>10.02.01 Demonstrate an understanding of DC power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.02 Identify components such as brushes, relays, breakers and bus bars</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.03 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.04 Demonstrate inspection procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.05 Demonstrate an understanding of specifications, characteristics, types and sizes of DC power system components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>10.02.06 Demonstrate an understanding of rating and compatibility of components such as bus bars breakers and distribution panels</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.07 Identify hazards associated with DC power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.08 Select and use testing tools and equipment such as thermal cameras, thermal sensors and multimeters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.09 Visually inspect system and recognize abnormalities</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.02.10 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>10.02.11 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				
<p>SUB-TASK 10.03</p> <p><u>Learning Objective</u> Troubleshoots DC power systems</p> <p>Continued next page</p>	<p>10.03.01 Demonstrate an understanding of DC power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.03.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.03.03 Identify components such as brushes, relays, breakers and bus bars</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.03.04 Demonstrate an understanding of specifications, characteristics, types and sizes of DC power system components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.03.05 Identify types and causes of failure of DC power system components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 10 - C
(cont'd)**

Learning Outcome
Maintains DC power systems

**Task 10
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 10.03 Continued <u>Learning Objective</u> Troubleshoots DC power systems JP Sign-off ____	10.03.06 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.07 Identify hazards associated with DC power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.08 Demonstrate troubleshooting procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.09 Follow safety procedures required to troubleshoot DC power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.10 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	10.03.11 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.12 Isolate faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.13 Recognize worn, damaged, defective or hazardous components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.03.14 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
SUB-TASK 10.04 <u>Learning Objective</u> Repairs DC power systems JP Sign-off ____	10.04.01 Demonstrate an understanding of DC power systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.02 Demonstrate an understanding of system and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.03 Identify components such as brushes, relays, breakers and bus bars Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.04 Follow safety procedures required for repair Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.05 Demonstrate repair, replacement, adjustment and modification procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	10.04.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.07 Replace, adjust and modify components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.08 Verify operation of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.09 Determine whether components require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.10 Select replacement components based on type, size and rating Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	10.04.11 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.12 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.13 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	10.04.14 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 10 - C
(cont'd)**

Learning Outcome
Maintains DC power systems

Task 10 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 10.05</p> <p><u>Learning Objective</u> Services DC power systems</p> <p>JP Sign-off _____</p>	<p>10.05.01 Demonstrate an understanding of DC power systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.03 Identify components such as brushes, relays, breakers and bus bars</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.04 Follow OEM specifications for preventative maintenance</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.05 Follow safety procedures required for service</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>10.05.06 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.07 Retrieve, document and interpret service test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.08 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.09 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.10 Confirm integrity of mounted components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>10.05.11 Verify terminations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.12 Perform adjustments</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.13 Verify operation of DC power system components to specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>10.05.14 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

Task 11 - C
4 questions on the IP exam

Learning Outcome
Maintains grounding and bonding systems

Journeyperson
 Sign-off
 Task 11

Complete

Incomplete

Task 11
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 11.01 <u>Learning Objective</u> Installs grounding and bonding systems JP Sign-off ____	11.01.01 Follow regulations regarding the installation of grounding and bonding systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.02 Identify types of grounding and bonding systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.03 Demonstrate an understanding of system and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.04 Identify components such as ground rods, ground grids, plates and anti-oxidant compounds Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.05 Demonstrate installation procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	11.01.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.07 Select components according to type, size, rating and environment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.08 Assemble components using processes such as exothermic welding Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.09 Determine fault carrying capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.10 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	11.01.11 Recognize hazards such as clearances and potential differences Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.01.12 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

SUB-TASK 11.02 <u>Learning Objective</u> Inspects grounding and bonding systems JP Sign-off ____	11.02.01 Identify types of grounding and bonding systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.02 Demonstrate an understanding of system and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.03 Verify grounding and bonding system specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.04 Recognize components, controls, ratings and capabilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.05 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	11.02.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.07 Visually inspect components for wear, oxidation and loose connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.08 Recognize corroded, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.09 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.02.10 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 11 - C
(cont'd)**

Learning Outcome
Maintains grounding and bonding systems

**Task 11
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 11.03</p> <p><u>Learning Objective</u> Troubleshoots grounding and bonding systems</p> <p>JP Sign-off _____</p>	<p>11.03.01 Demonstrate an understanding of types of grounding and bonding systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.03 Demonstrate an understanding of specifications, characteristics, types and sizes of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.04 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.05 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>11.03.06 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.07 Identify potential hazards such as shocks and potential difference</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.08 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.09 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.10 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>11.03.11 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.12 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.03.13 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		
<p>SUB-TASK 11.04</p> <p><u>Learning Objective</u> Repairs grounding and bonding systems</p> <p>Continued next page</p>	<p>11.04.01 Demonstrate an understanding of types of grounding and bonding systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.04.02 Demonstrate an understanding of system and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.04.03 Determine specifications, characteristics, types and sizes of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.04.04 Determine repair, replacement and modifications procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>11.04.05 Follow safety procedures required for repair</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 11 - C
(cont'd)**
Learning Outcome
Maintains grounding and bonding systems

**Task 11
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

Knowledge, Skills and Abilities - Competencies

SUB-TASK 11.04 Continued <u>Learning Objective</u> Repairs grounding and bonding systems JP Sign-off ____	11.04.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.04.07 Determine whether components require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.04.08 Select replacement components based on type, size, capacity and environment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.04.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.04.10 Locate and mount grounding and bonding components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	11.04.11 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.04.12 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			
SUB-TASK 11.05 <u>Learning Objective</u> Services grounding and bonding systems JP Sign-off ____	11.05.01 Demonstrate an understanding of types of grounding and bonding systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.02 Demonstrate an understanding of system and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.03 Determine specifications, characteristics, types and sizes of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.04 Follow OEM specifications for preventative maintenance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.05 Follow safety procedures and equipment required for service Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	11.05.06 Follow methods and procedures for testing and verification of grounding and bonding systems and components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.08 Clean components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.09 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.10 Check wiring and cable connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	11.05.11 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.12 Select replacement components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.13 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	11.05.14 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

Industrial Electrician

BLOCK D

22% - 22 Questions on the IP exam

Learning Category
ELECTRICAL EQUIPMENT

Task 12 - D

5 questions on the IP exam

Learning Outcome
Maintains protection devices

Journeyperson
Sign-off
Task 12

Complete

Incomplete

Task 12 Learning Needs

Sub-Tasks Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

- O - Observation
- I - Interview
- D - Documentation

Use:

- 1 - Daily
- 2 - Often
- 3 - Seldom
- 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 12.01 <u>Learning Objective</u> Installs protection devices JP Sign-off ____	12.01.01 Demonstrate an understanding of regulations regarding the installation of protection devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.02 Identify types of protection devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.03 Demonstrate an understanding of component characteristics, types, ratings and sizes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.04 Determine compatibility of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.05 Follow OEM installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	12.01.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.07 Assemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.08 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.01.09 Verify the system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 12.02 <u>Learning Objective</u> Inspects protection devices JP Sign-off ____	12.02.01 Identify types of protection devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.02 Demonstrate an understanding of device and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.03 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.04 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.05 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	12.02.06 Visually inspect protection devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.07 Perform function tests such as initiating overload trips and ground faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.08 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.02.09 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

**Task 12 - D
(cont'd)**

Learning Outcome
Maintains protection devices

Task 12 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 12.03</p> <p><u>Learning Objective</u> Troubleshoots protection devices</p> <p>JP Sign-off _____</p>	<p>12.03.01 Identify types of protection devices</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.02 Demonstrate an understanding of device and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.03 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.04 Identify potential hazards associated with protection devices</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.05 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>12.03.06 Determine probable causes of fault and appropriate corrective methods</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.07 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.08 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.09 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.10 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>12.03.11 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.12 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.13 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.03.14 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

**Task 12 - D
(cont'd)**

Learning Outcome
Maintains protection devices

**Task 12
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

- O - Observation
- I - Interview
- D - Documentation

Use:

- 1 - Daily
- 2 - Often
- 3 - Seldom
- 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 12.04 <u>Learning Objective</u> Repairs protection devices JP Sign-off _____	12.04.01 Demonstrate an understanding of types of protection devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.02 Determine devices and component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.03 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.04 Follow safety procedures required to repair protection devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.05 Demonstrate repair, replacement and modification procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	12.04.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.07 Determine whether components require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.08 Select replacement components based on type, size, capacity and environment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.10 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	12.04.11 Replace, adjust and test devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.12 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	12.04.13 Verify device operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 12 - D
(cont'd)**

Learning Outcome
Maintains protection devices

**Task 12
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 12.05</p> <p><u>Learning Objective</u> Services protection devices</p> <p>JP Sign-off _____</p>	<p>12.05.01 Identify types of protection devices</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.02 Demonstrate an understanding of devices and component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.03 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.04 Follow OEM preventative maintenance techniques, tests and procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.05 Follow safety procedures required to service protection devices</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>12.05.06 Follow procedures for testing and verification of protection devices and components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.07 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.08 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.09 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.10 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>12.05.11 Check wiring and cable connection</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.12 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.13 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>12.05.14 Verify device operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

Task 13 - D
7 questions on the IP exam

Learning Outcome
Maintains rotating equipment and associated controls

Journeyperson
 Sign-off
 Task 13

Complete

Incomplete

Task 13
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 13.01 <u>Learning Objective</u> Installs rotating equipment and associated controls JP Sign-off ____	13.01.01 Demonstrate an understanding of regulations regarding the installation of rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.02 Identify types and operation of rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.03 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.04 Follow installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.05 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	13.01.06 Select components according to specifications, characteristics, types, environments and sizes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.07 Assemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.08 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.09 Recognize hazards associated with rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.01.10 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 13.02 <u>Learning Objective</u> Inspects rotating equipment and associated controls JP Sign-off ____	13.02.01 Demonstrate an understanding of types and operation of rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.03 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.04 Select and use tools and equipment such as data monitors, infrared cameras and accelerometers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.05 Recognize worn, damaged or defective components such as bearings, brushes, commutators and slip rings Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	13.02.06 Recognize abnormal heat, sounds, odours, vibrations and arcing/sparking sources Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.07 Retrieve, document and interpret on-line and off-line diagnostic test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.02.08 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 13 - D
(cont'd)**

Learning Outcome
**Maintains rotating
equipment and associated
controls**

**Task 13
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 13.03</p> <p><u>Learning Objective</u> Troubleshoots rotating equipment and associated controls</p> <p>JP Sign-off _____</p>	<p>13.03.01 Demonstrate an understanding of types and operation of rotating equipment and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.03 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.04 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.05 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>13.03.06 Identify potential hazards associated with rotating equipment and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.07 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.08 Perform and interpret on-line and off-line diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.09 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.10 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>13.03.11 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.03.12 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			

**Task 13 - D
(cont'd)**

Learning Outcome
Maintains rotating
equipment and associated
controls

**Task 13
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 13.04 <u>Learning Objective</u> Repairs rotating equipment and associated controls JP Sign-off _____	13.04.01 Demonstrate an understanding of types and operation of rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.03 Follow safety procedures required for repair Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.04 Demonstrate repair, replacement, adjustment and modification procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.05 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	13.04.06 Determine whether components require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.07 Select replacement components based on type, size, environment and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.08 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.09 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.10 Adjust control parameters such as speed, acceleration and overload settings Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	13.04.11 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	13.04.12 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 13 - D
(cont'd)**

Learning Outcome
Maintains drives and associated controls

**Task 13
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 13.05</p> <p><u>Learning Objective</u> Services drives and associated controls</p> <p>JP Sign-off _____</p>	<p>13.05.01 Demonstrate an understanding of types and operation of rotating equipment and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.03 Demonstrate preventative maintenance techniques, tests and procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.04 Follow safety procedures required for service</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.05 Follow procedures for testing and verification of rotating equipment and associated controls, and their components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>13.05.06 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.07 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.08 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.09 Check wiring and cable connection</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.10 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>13.05.11 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.12 Confirm integrity of mounted components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.13 Verify operation of components according to specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>13.05.14 Document service and repairs performed</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

Task 14 - D
5 questions on the IP exam

Learning Outcome
Maintains drives and associated controls

Journeyperson
 Sign-off
 Task 14

Complete

Incomplete

Task 14
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

3 - Complete a task to the level and quality of performance required by industry without assistance or supervision

2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 14.01 <u>Learning Objective</u> Installs drives and associated controls JP Sign-off ____	14.01.01 Demonstrate an understanding of regulations regarding the installation of drives and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.02 Demonstrate an understanding of types and operation of drives and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.03 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.04 Follow OEM installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.05 Demonstrate an understanding of operating parameters of drives and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	14.01.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.07 Assemble drives and associated controls and their components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.08 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.09 Confirm performance within parameters such as deceleration, loading and acceleration Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	14.01.10 Recognize hazards related to drives and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	14.01.11 Verify device operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____					

**Task 14 - D
(cont'd)**

Learning Outcome
Maintains drives and associated controls

**Task 14
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 14.02</p> <p><u>Learning Objective</u> Inspects drives and associated controls</p> <p>JP Sign-off _____</p>	<p>14.02.01 Demonstrate an understanding of types and operation of drives and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.03 Demonstrate inspection procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.04 Demonstrate an understanding of operating parameters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>14.02.06 Recognize abnormal heat, sounds, odours, vibrations and arcing/sparking sources</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.07 Confirm performance within parameters such as deceleration, loading and acceleration</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.08 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.09 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.02.10 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>SUB-TASK 14.03</p> <p><u>Learning Objective</u> Troubleshoots drives and associated controls</p> <p>JP Sign-off _____</p>	<p>14.03.01 Demonstrate an understanding of types and operation of drives and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.03 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.04 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.05 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
		<p>14.03.06 Identify potential hazards related to drives and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.07 Demonstrate an understanding of operating parameters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.08 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.09 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.10 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
		<p>14.03.11 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.12 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.03.13 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

**Task 14 - D
(cont'd)**

Learning Outcome
Maintains drives and associated controls

**Task 14
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 14.04 <u>Learning Objective</u> Repairs drives and associated controls JP Sign-off _____	<p>14.04.01 Demonstrate an understanding of types and operation of drives and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.03 Follow safety procedures required for repair</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.04 Demonstrate repair, replacement, adjustment and modification procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>14.04.06 Determine whether components require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.07 Select replacement components based on type, size, environment and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.08 Assemble and disassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.09 Locate and mount components in appropriate locations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.10 Adjust control parameters such as speed, acceleration and overload settings</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>14.04.11 Document repair performed</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.04.12 Verify device operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			

**Task 14 - D
(cont'd)**

Learning Outcome
Maintains drives and associated controls

**Task 14
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 14.05</p> <p><u>Learning Objective</u> Services drives and associated controls</p> <p>JP Sign-off _____</p>	<p>14.05.01 Demonstrate an understanding of types and operation of drives and associated controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.03 Follow OEM preventative maintenance techniques, tests and procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.04 Demonstrate an understanding of operating parameters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.05 Follow safety procedures required for service</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>14.05.06 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.07 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.08 Retrieve, document and interpret service test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.09 Clean drives and associated controls, and their components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.10 Check wiring and cable connections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>14.05.11 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.12 Confirm integrity of mounted components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.13 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>14.05.14 Verify device operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

Task 15 - D
5 questions on the IP exam

Learning Outcome
Maintains non-rotating equipment and associated controls

Journeyperson
 Sign-off
 Task 15

Complete

Incomplete

Task 15
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 15.01 <u>Learning Objective</u> Installs non-rotating equipment and associated controls JP Sign-off ____	15.01.01 Demonstrate an understanding of types and operation of non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.03 Follow installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.04 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.05 Select components according to specifications, characteristics, type, environment and size Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	15.01.06 Assemble non-rotating equipment and associated controls and their components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.07 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.08 Recognize hazards related to non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.01.09 Verify equipment operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 15.02 <u>Learning Objective</u> Inspects non-rotating equipment and associated controls JP Sign-off ____	15.02.01 Demonstrate an understanding of types and operation of non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.03 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.04 Demonstrate an understanding of specifications for non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.05 Follow methods and procedures for inspecting non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	15.02.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.07 Recognize worn, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.08 Recognize operational abnormalities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.09 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.02.10 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 15 - E
(cont'd)**

Learning Outcome
**Maintains standby power
generating systems**

**Task 15
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

Knowledge, Skills and Abilities - Competencies

SUB-TASK 15.03 <u>Learning Objective</u> Troubleshoots non-rotating equipment and associated controls JP Sign-off _____	15.03.01 Demonstrate an understanding of types and operation of non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.03 Follow OEM specifications, procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.04 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.05 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	15.03.06 Identify potential hazards associated with non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.07 Demonstrate troubleshooting procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.08 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.10 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	15.03.11 Recognize worn, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.12 Isolate faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.03.13 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			
SUB-TASK 15.04 <u>Learning Objective</u> Repairs non-rotating equipment and associated controls JP Sign-off _____	15.04.01 Demonstrate an understanding of types and operation of non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.03 Follow safety procedures required for repair Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.04 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.05 Determine whether components require modification, adjustment, replacement or repair Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	15.04.06 Select replacement components based on type, size, environment and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.07 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.08 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.09 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.04.10 Verify equipment operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

**Task 15 - E
(cont'd)**

Learning Outcome
Maintains standby power
generating systems

**Task 15
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 15.05 <u>Learning Objective</u> Services non-rotating equipment and associated controls JP Sign-off _____	15.05.01 Demonstrate an understanding of types and operation of non-rotating equipment and associated controls Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.02 Demonstrate an understanding of controls, ratings, capabilities and characteristics Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.03 Follow OEM preventative maintenance techniques, tests and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.04 Follow safety procedures required for service Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.05 Demonstrate procedures for testing and verification of non-rotating equipment and associated controls, and their components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	15.05.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.07 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.08 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.09 Clean and lubricate components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.10 Check wiring and cable connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	15.05.11 Recognize worn, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.12 Confirm integrity of mounted components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.13 Document services performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	15.05.14 Verify equipment operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

Industrial Electrician

BLOCK E

7% - 7 Questions on the IP exam

Learning Category
EMERGENCY AND STANDBY SYSTEMS

Task 16 - E

3 questions on the IP exam

Learning Outcome
Maintains uninterruptible power supply systems (UPS)

Journeyman
Sign-off
Task 16

Complete

Incomplete

Task 16 Learning Needs

Sub-Tasks Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 16.01</p> <p><u>Learning Objective</u> Installs UPS systems</p> <p>JP Sign-off _____</p>	<p>16.01.01 Demonstrate an understanding of regulations regarding the installation of UPS systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.02 Demonstrate an understanding of types of UPS systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.03 Follow installation procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.04 Identify components such as batteries, inverters, solid state devices and heat sinks</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>16.01.06 Size UPS for application</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.07 Locate and mount systems and components in appropriate locations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.08 Assemble UPS components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.09 Identify hazard of stored energy in batteries and capacitors</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.01.10 Ensure adequate air flow</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
<p>SUB-TASK 16.02</p> <p><u>Learning Objective</u> Inspects UPS systems</p> <p>JP Sign-off _____</p>	<p>16.02.01 Demonstrate an understanding of UPS operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.02 Identify components such as batteries, solid-state devices and circuit boards</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.03 Demonstrate inspection procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.04 Recognize causes of component overheating such as dust, contamination, overloading and loose connections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.05 Select and use inspection equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>16.02.06 Retrieve, document and interpret data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.07 Perform overview of system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.08 Identify the hazard of stored energy in batteries and capacitors</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.09 Remove battery bank</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.10 Identify life of batteries</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>16.02.11 Check filters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.12 Perform sensory inspections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.13 Recognize worn, damaged or defective components such as batteries, inverters and connections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>16.02.14 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

Task 16 - E
(cont'd)

Learning Outcome
Maintains uninterrupted power supply systems (UPS)

Task 16
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 16.03 <u>Learning Objective</u> Troubleshoots UPS systems JP Sign-off _____	16.03.01 Recognize types, sizes, ratings and capabilities of UPS systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.02 Identify system fault indicators such as no output, alarms, odour, noise and breaker failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.03 Identify faults such as low battery voltage, low electrolyte level, incorrect charging rate and failed solid-state devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.04 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.05 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	16.03.06 Verify optimum equipment performance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.07 Select and use test equipment such as clamp-on ammeter, voltmeter, thermal scan and hydrometer Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.08 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.09 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.03.10 Isolate faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	16.03.11 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____					

**Task 16 - E
(cont'd)**

Learning Outcome
Maintains uninterruptible power supply systems (UPS)

**Task 16
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 16.04 <u>Learning Objective</u> Repairs UPS systems JP Sign-off ____	16.04.01 Recognize types, sizes, ratings and capabilities of UPS systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.02 Verify optimum system performance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.03 Follow repair and replacement procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.04 Demonstrate an understanding of the effects of static electricity on integrated circuits Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.05 Identify potential hazards of repair such as battery acid, hydrogen discharge and stored electrical energy Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	16.04.06 Select and use repair tools such as soldering iron, multimeter and common hand tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.07 Determine equipment affected by UPS shutdown Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.08 Determine whether to repair or replace components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.09 Select and replace components based on type, size and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.10 Coordinate repair with system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	16.04.11 Repair cold solder connections using soldering iron Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.12 Verify operation of replaced components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.13 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.04.14 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 16.05 <u>Learning Objective</u> Services UPS systems Continued next page	16.05.01 Demonstrate an understanding of compatibility of solvents with UPS components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.02 Verify optimum system performance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.03 Follow OEM procedures and techniques for preventative maintenance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.04 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.05 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	16.05.06 Coordinate service with system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.07 Maintain battery electrolyte level Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.08 Clean and lubricate components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.09 Measure specific gravity of batteries Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	16.05.10 Measure battery and charger voltage Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 16 - E
(cont'd)**

Learning Outcome
Maintains uninterruptible
power supply systems (UPS)

**Task 16
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 16.05 Continued <u>Learning Objective</u> Services UPS systems JP Sign-off _____	16.05.11 Replace fan filters	16.05.12 Check wiring and cable connections	16.05.13 Document service performed and required repairs	16.05.14 Verify system operation
	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

Task 17 - E
4 questions on the IP exam

Learning Outcome
Maintains standby power generating systems

Journeyman
 Sign-off
 Task 17

Complete

Incomplete

Task 17
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 17.01 <u>Learning Objective</u> Installs standby power generating systems JP Sign-off ____	17.01.01 Demonstrate an understanding of regulations regarding the installation of standby power generating systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.02 Identify types of alternate standby power generating systems such as solar, wind and tidal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.03 Demonstrate an understanding of components such as generators, exciters and regulators Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.04 Demonstrate an understanding of types of generators such as single- and three-phase Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.05 Follow OEM commissioning procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.01.06 Identify types of prime movers such as steam, diesel and gas Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.07 Demonstrate an understanding of load requirements such as voltage, phase and kilovolt-ampere (KVA) Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.08 Demonstrate an understanding of automatic and manual change-over systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.09 Demonstrate an understanding of electrical protection for generators Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.10 Demonstrate an understanding of environmental issues such as fuel containment, exhaust and noise Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.01.11 Recognize hazards in installing standby power generating systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.12 Select and use tools and equipment such as rigging equipment and alignment tools Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.13 Locate generator taking into consideration factors such as fuel storage, ventilation and accessibility Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.14 Connect generator to transfer switch with control and power wiring and cabling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.15 Level and secure generator to floor according to manufacturers' specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.01.16 Assemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.17 Commission standby power generating systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.01.18 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 17 - E
(cont'd)**

Learning Outcome
**Maintains standby power
generating systems**

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

**Task 17
Learning Needs**

**Sub-Tasks
Learning Objectives
to be completed
Comments**

SUB-TASK 17.02 <u>Learning Objective</u> Inspects standby power generating systems JP Sign-off ____	17.02.01 Demonstrate an understanding of types and operation of power generating systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.02 Identify components to inspect such as belts, louvers and filters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.03 Identify system components in alternate standby power generating systems such as wind, solar and tidal Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.04 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.05 Ensure guards are in place Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.02.06 Recognize worn, damaged or defective components such as bearings, brushes and slip rings Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.07 Recognize abnormal heat, sounds, odours, vibrations and arcing sources Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.08 Inspect battery charger system Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.09 Check fluid levels Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.10 Ensure proper start-up temperature of generator Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.02.11 Load test Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.12 Perform a manual transfer Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.13 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.02.14 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
SUB-TASK 17.03 <u>Learning Objective</u> Troubleshoots standby power generating systems Continued next page	17.03.01 Demonstrate an understanding of types, sizes, ratings and capabilities of standby power generating systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.02 Identify system fault indicators such as no output and alarms Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.03 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.04 Demonstrate troubleshooting procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.05 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 17 - E
(cont'd)**

Learning Outcome
**Maintains standby power
generating systems**

**Task 17
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 17.03 <u>Continued Learning Objective</u> Troubleshoots standby power generating systems JP Sign-off ____	17.03.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.07 Access system components for testing Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.08 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.10 Isolate faults such as short circuit, excessive loads and loose connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.03.11 Identify faulty components such as exciters, brushes and limit switches Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.03.12 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			
SUB-TASK 17.04 <u>Learning Objective</u> Repairs standby power generating systems JP Sign-off ____	17.04.01 Demonstrate an understanding of types of standby power generating systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.02 Demonstrate repair procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.03 Identify hazards of repair such as battery acid, stored energy in battery and accidental start-up of system Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.04 Demonstrate an understanding of control parameters such as speed and synchronization Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.05 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.04.06 Determine effects of system shutdown Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.07 Coordinate repair with system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.08 Determine whether to repair or replace components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.10 Select and replace components based on type, size and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	17.04.11 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.12 Verify operation of repaired or replaced components, and of the complete system Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.13 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.04.14 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	

Task 17 - E
(cont'd)

Learning Outcome
Maintains standby power generating systems

Task 17
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 17.05 <u>Learning Objective</u> Services standby power generating systems JP Sign-off ____	17.05.01 Identify types of standby power generating systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.02 Follow manufacturers' procedures and techniques for preventative maintenance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.03 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.04 Check wiring and cable connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.05 Check and change fluids Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	17.05.06 Measure specific gravity of batteries and maintain electrolyte level Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.07 Clean and lubricate components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.08 Change filters such as air, fuel and oil according to manufacturers' specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.09 Perform insulation test Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.10 Examine components such as exciters, governors and brushes Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	17.05.11 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.12 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	17.05.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

Industrial Electrician

BLOCK F

6% - 6 Questions on the IP exam

Learning Category
COMMUNICATION SYSTEMS

Task 18 - F

3 questions on the IP exam

Learning Outcome
Maintains alarm systems

Journeyperson
Sign-off
Task 18

Complete

Incomplete

Task 18 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 18.01 <u>Learning Objective</u> Installs alarm systems JP Sign-off ____	18.01.01 Demonstrate an understanding of regulations regarding the installation of alarm systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.02 Identify types of alarm systems such as fire, security and gas Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.03 Follow OEM specifications for installation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.04 Identify alarm system components such as initiation and annunciation devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	18.01.06 Demonstrate installation procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.08 Assemble alarm system components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.09 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.10 Test and verify alarm system components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	18.01.11 Configure circuitry for alarm systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.12 Connect alarm systems to communication systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.01.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

SUB-TASK 18.02 <u>Learning Objective</u> Inspects alarm systems Continued next page	18.02.01 Demonstrate an understanding of regulations regarding the inspection of alarm systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.02 Identify types of alarm systems such as fire, security and gas Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.03 Identify alarm system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.04 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.05 Follow OEM specifications for inspections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	18.02.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.07 Follow inspection procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.08 Perform sensory inspections of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.09 Recognize worn, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.02.10 Identify hazards Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 18 - F
(cont'd)**

Learning Outcome
Maintains alarm systems

**Task 18
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 18.02</p> <p>Continued</p> <p><u>Learning Objective</u> Inspects alarm systems</p> <p>JP Sign-off _____</p>	<p>18.02.11 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.02.12 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.02.13 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		
	<p>18.03.01 Demonstrate an understanding of regulations regarding the troubleshooting of alarm systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.02 Identify types of alarm systems such as fire, security and gas</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.03 Identify alarm system components, controls and parameters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.04 Follow OEM specifications for troubleshooting</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.05 Verify component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>18.03.06 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.07 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.08 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.09 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.10 Isolate faults in alarm systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
<p>18.03.11 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.12 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.03.13 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			

**Task 18 - F
(cont'd)**

Learning Outcome
Maintains alarm systems

**Task 18
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 18.04</p> <p><u>Learning Objective</u> Repairs alarm systems</p> <p>JP Sign-off _____</p>	<p>18.04.01 Demonstrate an understanding of regulations regarding the repair of alarm systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.02 Identify types of alarm systems such as fire, security and gas</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.03 Identify alarm system components, controls and parameters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.04 Follow OEM specifications for repair</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.05 Verify component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>18.04.06 Demonstrate repair procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.07 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.08 Determine whether components require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.09 Select replacement components based on characteristics such as type, size, environment and capacity</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.10 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>18.04.11 Locate and mount components in appropriate locations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.12 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>18.04.13 Document repairs performed</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

**Task 18 - F
(cont'd)**

Learning Outcome
Maintains alarm systems

**Task 18
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 18.05 <u>Learning Objective</u> Services alarm systems JP Sign-off ____	18.05.01 Demonstrate an understanding of regulations regarding the servicing of alarm systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.02 Identify types of alarm systems such as fire, security and gas Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.03 Identify alarm system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.04 Follow OEM specifications regarding preventative maintenance schedules and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.05 Demonstrate an understanding of components, controls, capabilities and characteristics Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	18.05.06 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.08 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.09 Clean components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.10 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	18.05.11 Select replacement components based on type, size, environment and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.12 Check, wiring and cable connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.13 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	18.05.14 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

Task 19 - F
1 question on the IP exam

Learning Outcome
Maintains paging systems

Journeyperson
 Sign-off
 Task 19

Complete

Incomplete

Task 19
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 19.01 <u>Learning Objective</u> Installs paging systems JP Sign-off ____	19.01.01 Demonstrate an understanding of regulations regarding the installation of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.02 Identify types of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.03 Follow OEM specifications for installation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.04 Identify paging system components such as intercoms, speakers and pagers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	19.01.06 Follow installation procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.08 Assemble paging system components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.09 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.10 Test and verify paging components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	19.01.11 Configure circuitry for paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.12 Connect paging systems to communication systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.01.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

SUB-TASK 19.02 <u>Learning Objective</u> Inspects paging systems Continued next page	19.02.01 Demonstrate an understanding of regulations regarding the inspection of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.01 Identify types of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.03 Identify paging system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.04 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.05 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	19.02.06 Follow OEM specifications for inspections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.08 Perform sensory inspections of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.09 Recognized worn, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.10 Identify hazards in improper installation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 19 - F
(cont'd)**

Learning Outcome
Maintains paging systems

**Task 19
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 19.02 Continued <u>Learning Objective</u> Inspects paging systems JP Sign-off ____	19.02.11 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.12 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.02.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		
	SUB-TASK 19.03 <u>Learning Objective</u> Troubleshoots paging systems JP Sign-off ____	19.03.01 Demonstrate an understanding of regulations regarding the troubleshooting of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.02 Identify types of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.03 Identify paging system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.04 Follow OEM specifications for troubleshooting Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	19.03.06 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.07 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.08 Demonstrate troubleshooting procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.09 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.10 Isolate faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	19.03.11 Identify faulty components such as speakers, transformers and signals Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.12 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.13 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.14 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.03.15 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 19 - F
(cont'd)**

Learning Outcome
Maintains paging systems

**Task 19
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 19.04 <u>Learning Objective</u> Repairs paging systems JP Sign-off ____	19.04.01 Demonstrate an understanding of regulations regarding the repair of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.02 Identify types of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.03 Identify paging system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.04 Follow OEM specifications for repair Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	19.04.06 Demonstrate repair procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.08 Determine whether components require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.09 Select replacement components based on type, size, environment and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.10 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	19.04.11 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.12 Verify system operation according to OEM specifications Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.04.13 Document repairs performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 19 - F
(cont'd)**

Learning Outcome
Maintains paging systems

**Task 19
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 19.05 <u>Learning Objective</u> Services paging systems JP Sign-off ____	19.05.01 Demonstrate an understanding of regulations regarding the servicing of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.02 Identify types of paging systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.03 Identify paging system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.04 Follow OEM specifications regarding preventative maintenance schedules and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	19.05.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.07 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.08 Clean components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.09 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.10 Select replacement components based on type, size, environment and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	19.05.11 Check wiring and cable connection Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.12 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	19.05.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

Task 20 - F
1 question on the IP exam

Learning Outcome
Maintains audio-visual systems

Journey person
 Sign-off
 Task 20

Complete

Incomplete

Task 20
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 20.01 <u>Learning Objective</u> Installs audio-visual systems JP Sign-off ____	20.01.01 Demonstrate an understanding of regulations regarding the installation of audio-visual systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.02 Identify types of audio-visual systems such as analog and digital Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.03 Follow OEM specifications for installation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.04 Identify components such as speakers, cameras, monitors and receivers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	20.01.06 Demonstrate installation procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.07 Determine appropriate types of cables such as fibre optic Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.08 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.09 Assemble audio-visual system components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.10 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	20.01.11 Configure circuitry for audio-visual systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.12 Connection audio-visual systems to communication systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

SUB-TASK 20.02 <u>Learning Objective</u> Inspects audio-visual systems JP Sign-off ____	20.02.01 Identify types of audio-visual systems such as analog and digital Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.02 Identify audio-visual system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.03 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.04 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.05 Follow OEM specifications for inspections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	20.02.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.07 Perform sensory inspection of components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.08 Recognize worn, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.09 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.02.10 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 20 - F
(cont'd)**

Learning Outcome
Maintains audio-visual
systems

**Task 20
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

- O - Observation
- I - Interview
- D - Documentation

Use:

- 1 - Daily
- 2 - Often
- 3 - Seldom
- 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 20.03</p> <p><u>Learning Objective</u> Troubleshoots audio-visual systems</p> <p>JP Sign-off _____</p>	<p>20.03.01 Identify types of audio-visual systems such as analog and digital</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.02 Identify audio-visual system components, controls and parameters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.03 Follow OEM specifications for troubleshooting</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.04 Verify component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.05 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>20.03.06 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.07 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.08 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.09 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.10 Identify faulty components such as cameras, speakers and relays</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>20.03.11 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.12 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.13 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.03.14 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
<p>SUB-TASK 20.04</p> <p><u>Learning Objective</u> Repairs audio-visual systems</p> <p>Continued next page</p>	<p>20.04.01 Demonstrate an understanding of regulations regarding the repair of audio-visual systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.04.02 Identify audio-visual system components, controls and parameters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.04.03 Identify types of audio-visual systems such as analog and digital</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.04.04 Follow OEM specifications for repair</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>20.04.05 Verify component operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 20 - F
(cont'd)**

Learning Outcome
Maintains audio-visual systems

Task 20 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 20.04</p> <p>Continued</p> <p><u>Learning Objective</u> Repairs audio-visual systems</p> <p>JP Sign-off _____</p>	<p>20.04.06 Demonstrate repair procedures and techniques</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.04.07 Select and use tools and equipment</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.04.08 Determine whether components require repair or replacement</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.04.09 Select replacement components based on type, size and capacity</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.04.10 Disassemble and reassemble components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	
	<p>20.04.11 Locate and mount components in appropriate locations</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.04.12 Verify system operation</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.04.13 Document modifications and repairs performed</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>			
	<p>SUB-TASK 20.05</p> <p><u>Learning Objective</u> Services audio-visual systems</p> <p>JP Sign-off _____</p>	<p>20.05.01 Demonstrate an understanding of regulations regarding the servicing of audio-visual systems</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.02 Identify types of audio-visual systems such as analog and digital</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.03 Identify audio-visual system components, controls, parameters and capabilities</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.04 Follow OEM specifications regarding preventative maintenance schedules and procedures</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.05 Verify component operation</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>
		<p>20.05.06 Review equipment performance history</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.07 Select and use tools and equipment</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.08 Disassemble and reassemble components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.09 Clean components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.10 Identify components that require repair or replacement</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>
		<p>20.05.11 Select replacement components based on type, size and capacity</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.12 Check wiring and cable connections</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.13 Document service performed</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>20.05.14 Verify system operation</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	

Task 21 - F
1 question on the IP exam

Learning Outcome
Maintains network systems

Journeyperson
 Sign-off
 Task 21

Complete

Incomplete

Task 21
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 21.01 <u>Learning Objective</u> Installs network systems JP Sign-off ____	21.01.01 Demonstrate an understanding of regulations regarding the installation of network systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.01.02 Identify types of network systems such as Ethernet, peer to peer and wireless Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.01.03 Recognize and follow specifications for installation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.01.04 Identify components such as modems, routers and switches Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.01.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	20.01.06 Follow installation procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.08 Assemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.09 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.10 Configure system parameters and circuitry Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	20.01.11 Link network systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	20.01.12 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 21 - F
(cont'd)**

Learning Outcome
Maintains network systems

**Task 21
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 21.02 <u>Learning Objective</u> Inspects network systems JP Sign-off ____	21.02.01 Identify types of network systems such as Ethernet, peer to peer and wireless Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.02 Identify network system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.03 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.04 Demonstrate inspection procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.05 Follow specifications for inspections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	21.02.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.07 Visually inspect components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.08 Recognize worn, damaged or defective components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.09 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.02.10 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
SUB-TASK 21.03 <u>Learning Objective</u> Troubleshoots network systems JP Sign-off ____	21.03.01 Demonstrate an understanding of regulations regarding the troubleshooting of network systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.02 Identify types of network systems such as Ethernet, peer to peer and wireless Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.03 Identify network system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.04 Follow specifications for troubleshooting Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	21.03.06 Determine events that led to system failure Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.07 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.08 Demonstrate troubleshooting techniques and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.09 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.10 Isolate faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	21.03.11 Identify faulty components such as cards, connectors and cabling Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.12 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.13 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.14 Retrieve, document and interpret test data Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.03.15 Document faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

**Task 21 - F
(cont'd)**

Learning Outcome
Maintains network systems

**Task 21
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 21.04 <u>Learning Objective</u> Repairs network systems JP Sign-off ____	21.04.01 Demonstrate an understanding of regulations regarding the repair of network systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.02 Identify network system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.03 Identify types of network systems such as Ethernet, peer to peer and wireless Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.04 Follow specifications for repair Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.05 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	21.04.06 Demonstrate repair procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.08 Determine whether components require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.09 Select replacement components based on type, size, environment and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.10 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	21.04.11 Locate and mount components in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.12 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.04.13 Document modifications and repairs performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 21 - F
(cont'd)**

Learning Outcome
Maintains network systems

**Task 21
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 21.05 <u>Learning Objective</u> Services network systems JP Sign-off ____	21.05.01 Demonstrate an understanding of regulations regarding the servicing of network systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.02 Identify types of network systems such as Ethernet, peer to peer and wireless Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.03 Identify network system components, controls and parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.04 Follow OEM specifications regarding preventative maintenance schedules and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.05 Identify network system components, controls and capabilities Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	21.05.06 Verify component operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.07 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.08 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.10 Clean components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	21.05.11 Identify components that require repair or replacement Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.12 Select replacement components based on type, size, environment and capacity Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.13 Check wiring and cable connections Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.14 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	21.05.15 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

Industrial Electrician

BLOCK G
13% - 13 Questions on the IP exam

Learning Category
PROCESS CONTROL SYSTEMS

Task 22 - G
7 questions on the IP exam

Learning Outcome
Maintains input/output field devices

Journeyperson
 Sign-off
 Task 22

Complete

Incomplete

Task 22 Learning Needs

Sub-Tasks Learning Objectives to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 22.01 <u>Learning Objective</u> Installs input/output field devices JP Sign-off _____	22.01.01 Demonstrate an understanding of regulations regarding the installation of input/output field devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.02 Identify types and functions of input field devices such as transducers, limit switches and energy stop switches Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.03 Identify types and functions of output field devices such as indicator lights, solenoids and control valves Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.04 Verify compatibility of devices with PLCs or DCSs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.05 Recognize installation environment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	22.01.06 Verify operation of input/output field devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.07 Verify type, size and rating of devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.08 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.09 Locate and mount devices in appropriate locations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.10 Connect devices to system Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	22.01.11 Calibrate devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.12 Commission devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.01.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

**Task 22 - G
(cont'd)**

Learning Outcome
Maintains input/output field devices

**Task 22
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 22.02</p> <p><u>Learning Objective</u> Inspects input/output field devices</p> <p>JP Sign-off _____</p>	<p>22.02.01 Identify types and functions of input field devices such as transducers, limit switches and emergency stop switches</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.02.02 Identify types and functions of output field devices such as indicator lights, solenoids and control valves</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.02.03 Demonstrate inspection procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.02.04 Demonstrate an understanding of the effect that the inspection has on the system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.02.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>22.02.06 Assemble and disassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.02.07 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.02.08 Detect input/output field device defects such as corrosion, loose wiring and cabling, mechanical damage and wear</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.02.09 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		
<p>SUB-TASK 22.03</p> <p><u>Learning Objective</u> Troubleshoots input/output field devices</p> <p>JP Sign-off _____</p>	<p>22.03.01 Identify types and functions of input field devices such as transducers, limit switches and emergency stop switches</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.02 Identify types and functions of output field devices such as indicator lights, solenoids and control valves</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.03 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.04 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.05 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>22.03.06 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.07 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.08 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.09 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.10 Detect input/output field device faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>22.03.11 Use PLC as a troubleshooting tool</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.12 Identify and isolate faulty components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.03.13 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			

**Task 22 - G
(cont'd)**

Learning Outcome
Maintains input/output field devices

**Task 22
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 22.04 <u>Learning Objective</u> Repairs input/output field devices JP Sign-off _____	22.04.01 Identify types and functions of input field devices such as transducers, limit switches and emergency stop switches Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.02 Identify types and functions of output field devices such as indicator lights, solenoids and control valves Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.03 Demonstrate repair procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.04 Verify compatibility of replacement components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.05 Determine types of connectors, cabling and shielding Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	22.04.06 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.07 Calibrate, adjust and align devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.08 Replace and relocate devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.10 Verify operation of replaced, aligned, adjusted and calibrated devices Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	22.04.11 Determine whether to repair or replace components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.12 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	22.04.13 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____			

**Task 22 - G
(cont'd)**

Learning Outcome
Maintains input/output field devices

**Task 22
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 22.05</p> <p><u>Learning Objective</u> Servicing input/output field devices</p> <p>JP Sign-off _____</p>	<p>22.05.01 Identify types and functions of input field devices such as transducers, limit switches and emergency stop switches</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.02 Identify types and functions of output field devices such as indicator lights, solenoids and control valves</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.03 Demonstrate service procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.04 Select types of lubricants and anti-corrosion compounds</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>22.05.06 Check wiring and cable connections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.07 Examine components such as limit switches, photocells and transmitters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.08 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.09 Calibrate and align devices such as photocells, transmitters and control valves</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.10 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>22.05.11 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.12 Verify operation of input/output field devices following service</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.13 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>22.05.14 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

Task 23 - G
6 questions on the IP exam

Learning Outcome
Maintains process control systems

Journeyperson
 Sign-off
 Task 23

Complete

Incomplete

Task 23
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 23.01</p> <p><u>Learning Objective</u> Inspects process control systems</p> <p>JP Sign-off _____</p>	<p>23.01.01 Recognize power supply criteria such as type, size and rating</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.02 Identify components such as monitors, CPUs and I/O racks</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.03 Follow installation procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.04 Demonstrate an understanding of interference such as harmonics and electromagnetic interference (EMI)</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.05 Follow grounding and bonding according to OEM specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>23.01.06 Identify types of output relays such as solid-state and mechanical</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.07 Identify types of hardware used for constructing process control systems such as rail devices and wire channels</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.08 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.09 Assemble and connect components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.10 Locate and mount components in appropriate locations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>23.01.11 Upload, download and install programs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.01.12 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			

**Task 23 - G
(cont'd)**

Learning Outcome
Maintains process control systems

**Task 23
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 23.02</p> <p><u>Learning Objective</u> Inspects process control systems</p> <p>JP Sign-off _____</p>	<p>23.02.01 Identify types of process control systems and components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.02 Demonstrate an understanding of process</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.03 Demonstrate inspection procedures and techniques</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.04 Select and use tools and equipment</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.05 Monitor fault lights</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	
	<p>23.02.06 Visually inspect components for conditions such as heat, dust and apparent damage</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.07 Retrieve backup program</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.08 Access process controller for inspection</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.09 Retrieve, document and interpret test data</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.02.10 Document faults</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	
	<p>SUB-TASK 23.03</p> <p><u>Learning Objective</u> Troubleshoots process control systems</p> <p>JP Sign-off _____</p>	<p>23.03.01 Identify types and functions of process control systems and components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.02 Determine probable causes of faults such as overloaded power supply, faulty communication card and board failure</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.03 Demonstrate troubleshooting procedures and techniques</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.04 Determine events that led to system failure</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.05 Review equipment performance history</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>
		<p>23.03.06 Determine events that led to system failure</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.07 Select and use tools and equipment such as computer software</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.08 Disassemble and reassemble components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.09 Perform and interpret diagnostic tests</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.10 Identify and isolate faulty components</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>
		<p>23.03.11 Retrieve, document and interpret test data</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>	<p>23.03.12 Download and install programs</p> <p>Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___</p>			

**Task 23 - G
(cont'd)**

Learning Outcome
Maintains process control systems

**Task 23
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 23.04</p> <p><u>Learning Objective</u> Repairs process control systems</p> <p>JP Sign-off _____</p>	<p>23.04.01 Demonstrate an understanding of process operation and associated software</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.02 Demonstrate repair procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.03 Demonstrate an understanding of effects of static electricity on system components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.04 Demonstrate an understanding of OEM system capabilities such as replacement of components when system is energized</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>23.04.06 Determine equipment affected by process control system shutdown</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.07 Select and replace components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.08 Coordinate repair with system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.09 Download and install programs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.10 Configure replacement cards and peripherals</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>23.04.11 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.12 Verify operation of system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.04.13 Document repair performed</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

**Task 23 - G
(cont'd)**

Learning Outcome
Maintains process control systems

**Task 23
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 23.05</p> <p><u>Learning Objective</u> Services process control systems</p> <p>JP Sign-off _____</p>	<p>23.05.01 Follow OEM preventative maintenance schedules and procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.02 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.03 Clean components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.04 Coordinate service with system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.05 Replace fan filters</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>23.05.06 Check wiring and cable connections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.07 Replace backup battery</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.08 Reload program</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.09 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>23.05.10 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>23.05.11 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				

**Task 23 - G
(cont'd)**

Learning Outcome
Maintains process control systems

Task 23 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 23.06 <u>Learning Objective</u> Optimizes PLCs JP Sign-off ____	23.06.01 Identify types of PLCs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.02 Demonstrate an understanding of PLC capabilities such as on-line and off-line programming Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.03 Demonstrate an understanding of performance parameters of systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.04 Recognize capabilities and limitations of systems and components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.05 Identify process requirements Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	23.06.06 Identify types of converters such as current to pressure (I/P) and temperature to pressure (T/P) Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.07 Identify types of cards such as analog input and output, and digital input and output Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.08 Demonstrate an understanding of software and hardware modification procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.09 Upload, download and install programs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.10 Modify system parameters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	23.06.11 Ensure current version of software Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.12 Use and modify programming software Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.13 Change programming logic Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.14 Verify configuration results Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	23.06.15 Configure components such as I/O cards and peripherals Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____

Industrial Electrician

BLOCK H

6% - 6 Questions on the IP exam

Learning Category
BUILDING AND ENVIRONMENTAL CONTROL SYSTEMS

Task 24 - H

3 questions on the IP exam

Learning Outcome
 Maintains electrical components of heating and cooling systems

Journeyperson
 Sign-off
 Task 24

Complete

Incomplete

Task 24 Learning Needs

Sub-Tasks

Learning Objectives
 to be completed

Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 24.01 <u>Learning Objective</u> Installs electrical components of heating and cooling systems JP Sign-off _____	24.01.01 Identify types of heating systems such as heat pumps, boilers and resistive types Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.02 Identify types of cooling systems such as heat pumps, chillers and exchangers Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.03 Identify types of electrical components such as contactors, compressors, actuators, temperature sensors and servomotors Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.04 Demonstrate an understanding of the operation of heating and cooling systems Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.05 Demonstrate an understanding of building applications such as refinery labs, hospitals, food processing plants and commercial buildings Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___
	24.01.06 Demonstrate an understanding of air flow balancing Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.07 Identify building construction such as brick, wood and stressed skin panel Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.08 Determine system sizing Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.09 Select and use tools and equipment Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.10 Connect components to building management controllers Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___
	24.01.11 Modify installation as needed Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.12 Document baseline settings Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___	24.01.13 Verify system operation Rating ___ Complete Proof ___ <input type="checkbox"/> Use ___		

**Task 24 - H
(cont'd)**

Learning Outcome
Maintains electrical components of heating and cooling systems

Task 24 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 24.02 <u>Learning Objective</u> Inspects electrical components of heating and cooling systems JP Sign-off _____	24.02.01 Identify types and operation of heating and cooling systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.02 Verify operation of electrical components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.03 Demonstrate inspection techniques and procedures Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.04 Follow confined space entry and egress regulations Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.05 Select and use tools and equipment such as digital camera, airflow and electrical meters, and thermal scan Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	24.02.06 Recognize warn, damaged or defective components such as actuators, contactors and sensors Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.07 Recognize abnormal heat, sounds and odours Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.08 Access devices for inspection Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.09 Complete inspection reports Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.02.10 Detect component defects such as corrosion, loose wiring and cabling, mechanical damage and wear Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	24.02.11 Identify hazards when conducting inspections such as live voltages, dangerous gases, and restricted access and egress Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 24 - H
(cont'd)**

Learning Outcome
Maintains electrical components of heating and cooling systems

**Task 24
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 24.03</p> <p><u>Learning Objective</u> Troubleshoots electrical components of heating and cooling systems</p> <p>JP Sign-off _____</p>	<p>24.03.01 Identify types and operation of heating and cooling systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.02 Demonstrate an understanding of types, ratings and operation of electrical components such as sensors, relays and controllers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.03 Determine faults such as failed zone actuators and damaged elements</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.04 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.05 Recognize physical properties and hazards of refrigerants</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>24.03.06 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.07 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.08 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.09 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.03.10 Isolate system faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>24.03.11 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				
<p>SUB-TASK 24.04</p> <p><u>Learning Objective</u> Repairs electrical components of heating and cooling systems</p> <p>Continued next page</p>	<p>24.04.01 Follow repair, replacement and adjustment procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.02 Demonstrate an understanding of types, ratings and operation of electrical components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.03 Verify operation of heating and cooling systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.04 Verify compatibility of replacement components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.05 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>24.04.06 Replace system components such as sensors, relays and controllers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.07 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.08 Determine whether to repair or replace components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.09 Adjust sensors and controls</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>24.04.10 Mount and secure electrical components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>

**Task 24 - H
(cont'd)**

Learning Outcome
Maintains electrical components of heating and cooling systems

**Task 24
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 24.04 Continued <u>Learning Objective</u> Repairs electrical components of heating and cooling systems JP Sign-off _____	24.04.11 Connect electrical equipment to power supply Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.04.12 Integrate components into building management system Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.04.13 Recognize hazards such as steam, compressed air and gases Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.04.14 Verify operation of repaired, replaced and adjusted components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.04.15 Verify system operation Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	24.04.16 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 24 - H
(cont'd)**

Learning Outcome
Maintains electrical components of heating and cooling systems

Task 24 Learning Needs

Sub-Tasks Learning Objectives to be completed
Comments

Knowledge, Skills and Abilities - Competencies						
SUB-TASK 24.05 <u>Learning Objective</u> Services electrical components of heating and cooling systems JP Sign-off ____	24.05.01 Follow OEM procedures and techniques for performing preventative maintenance Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.02 Identify types, rating and operation of electrical components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.03 Follow calibration procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.04 Review equipment performance history Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.05 Select types of lubricants Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	24.05.06 Recognize hazards such as steam, compressed air and gases Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.07 Select and use tools and equipment such as manometers, pressure simulators and multimeters Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.08 Clean and lubricate components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.09 Align devices such as belts, pulleys and actuators Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.10 Perform and interpret diagnostic tests Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	24.05.11 Isolate faults Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.12 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.13 Verify operation of heating and cooling systems following service Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	24.05.14 Document service performed and required repairs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____		

Task 25 - H
1 question on the IP exam

Learning Outcome
Maintains building automation systems

Journeyperson
 Sign-off
 Task 25

Complete

Incomplete

Task 25
Learning Needs

Sub-Tasks
Learning Objectives
 to be completed
 Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 25.01 <u>Learning Objective</u> Inspects building automation systems JP Sign-off _____	25.01.01 Demonstrate an understanding of regulations regarding the installation of building automation systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.02 Identify types of building automation systems such as energy and security Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.03 Identify components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.04 Verify operation of building automation systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.05 Identify types of building using automated systems such as office buildings, manufacturing plants and hospitals Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	25.01.06 Demonstrate an understanding of cabling and shielding Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.07 Select and use tools and equipment Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.08 Install and connect computers and associated software Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.09 Modify installation as needed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.10 Record baseline settings Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	
	25.01.11 Connect components to building management controllers Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.01.12 Commission building automation systems Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 25 - H
(cont'd)**

Learning Outcome
Maintains building automation systems

**Task 25
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 25.02</p> <p><u>Learning Objective</u> Inspects building automation systems</p> <p>JP Sign-off _____</p>	<p>25.02.01 Identify components of building automation systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.02.02 Follow inspection procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.02.03 Demonstrate an understanding of building automation system software</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.02.04 Recognize defects such as temperature imbalance and unresponsive system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.02.05 Interpret building automation system software information</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	
	<p>25.02.06 Access devices for inspection</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.02.07 Complete inspection reports</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.02.08 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.02.09 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		
	<p>SUB-TASK 25.03</p> <p><u>Learning Objective</u> Troubleshoots building automation systems</p> <p>JP Sign-off _____</p>	<p>25.03.01 Demonstrate an understanding of building automation systems and software</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.02 Recognize types and ratings of connected components such as temperature sensors and actuators</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.03 Determine faults such as temperature imbalance and unresponsive systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.04 Recognize the effect faults on the system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.05 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
		<p>25.03.06 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.07 Select and use tools and equipment such as portable computers, multimeters and thermometers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.08 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.09 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.10 Recognize faults in building automation systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
		<p>25.03.11 Isolate system faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.03.12 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>			

**Task 25 - H
(cont'd)**

Learning Outcome
Maintains building automation systems

Task 25 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 25.04 <u>Learning Objective</u> Repairs building automation systems JP Sign-off _____	25.04.01 Demonstrate repair, replacement, programming and adjustment procedures and techniques Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.02 Recognize types, ratings and operation of electrical components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.03 Replace components such as actuators, sensors and valves Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.04 Adjust components such as actuators, proximity and limit switches Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.05 Modify and backup building automation system programs Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	25.04.06 Download and install software updates Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.07 Determine whether to repair or replace components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.08 Recognize hazards such as steam, compressed air and gases Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.09 Disassemble and reassemble components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____	25.04.10 Verify operation of repaired, replaced, reprogrammed and adjusted components Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____
	25.04.11 Document repair performed Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____				

**Task 25 - H
(cont'd)**

Learning Outcome
Maintains building
automation systems

**Task 25
Learning Needs**

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 25.05</p> <p><u>Learning Objective</u> Services building automation systems</p> <p>JP Sign-off _____</p>	<p>25.05.01 Follow procedures and techniques for servicing building automation systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.02 Identify types and ratings of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.03 Follow calibration procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.04 Demonstrate an understanding of calibration devices such as air supply and current source potentiometers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.05 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>25.05.06 Periodically back up software</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.07 Periodically download and install updates</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.08 Select and use tools and equipment such as calibration devices, laptop computers and hand tools</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.09 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.10 Align devices such as belts, pulleys and actuators</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>25.05.11 Identify components that require replacement and repair</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.12 Verify operation of building automation systems following service</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.13 Document services performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

Task 26 - H
2 questions on the IP exam

Learning Outcome
Maintains environmental control systems

Journeyperson
Sign-off
Task 26

Complete

Incomplete

Task 26
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
- 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
- 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
- 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
- 2 - Complete a task with some assistance and supervision
- 1 - Complete task with assistance and constant supervision

Type of Proof:

- O - Observation
- I - Interview
- D - Documentation

Use:

- 1 - Daily
- 2 - Often
- 3 - Seldom
- 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 26.01</p> <p><u>Learning Objective</u> Installs environmental control systems</p> <p>JP Sign-off _____</p>	<p>26.01.01 Follow regulations regarding the installation of environmental control systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.02 Identify types of environmental control systems such as waste management, noise reduction, water treatment, dust suppression and stack emissions</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.03 Identify types, sizes and ratings of components such as samplers, particulate analyzers, scrubbers and skimmers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.04 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.05 Install and connect components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>26.01.06 Store, contain, handle and dispose of hazardous materials according to regulations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.07 Locate and mount devices in appropriate location and position</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.08 Commission environmental control systems</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.09 Record baseline settings</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.01.10 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
<p>SUB-TASK 26.02</p> <p><u>Learning Objective</u> Inspects environmental control systems</p> <p>JP Sign-off _____</p>	<p>26.02.01 Identify types of operation of environmental control systems such as waste management, noise reduction, water treatment and stack emissions</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.02.02 Demonstrate an understanding of characteristics and specifications of components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.02.03 Follow inspection procedures and techniques</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.02.04 Follow environmental related regulations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.02.05 Recognize hazards such as chemicals, ultraviolet light, residue and high voltage</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>26.02.06 Perform sensory inspections</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.02.07 Recognize worn, damaged or defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.02.08 Retrieve, document and interpret inspection data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.02.09 Document faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

**Task 26 - H
(cont'd)**

Learning Outcome
Maintains environmental control systems

Task 26 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 26.03</p> <p><u>Learning Objective</u> Troubleshoots environmental control systems</p> <p>JP Sign-off _____</p>	<p>26.03.01 Demonstrate an understanding of system operation and capabilities</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.02 Determine probable causes of faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.03 Demonstrate an understanding of diagnostic equipment such as leak detectors, meters and stack monitors</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.04 Determine events that led to system failure</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.05 Review equipment performance history</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>26.03.06 Demonstrate an understanding of and follow procedures for response and containment of environmental discharge</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.07 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.08 Recognize hazards such as chemicals, ultraviolet light, residue and high voltage</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.09 Interpret readings from process controller</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.10 Comply with regulations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>26.03.11 Perform and interpret diagnostic tests</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.12 Isolate defective components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.13 Document and report environmental discharge</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.14 Isolate faults</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.03.15 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>25.03.16 Retrieve, document and interpret test data</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>				

**Task 26 - H
(cont'd)**

Learning Outcome
Maintains environmental control systems

Task 26 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

- Rating:**
- 6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
 - 5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
 - 4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
 - 3 - Complete a task to the level and quality of performance required by industry without assistance or supervision**
 - 2 - Complete a task with some assistance and supervision
 - 1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 26.04</p> <p><u>Learning Objective</u> Repairs environmental control systems</p> <p>JP Sign-off _____</p>	<p>26.04.01 Demonstrate an understanding of operation of overall system</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.02 Identify hazards such as chemicals, gases, ultraviolet light and high voltage</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.03 Determine impact of environmental control system shutdown</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.04 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.05 Follow OEM repair procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>26.04.06 Disassemble and reassemble components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.07 Determine whether to repair or replace components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.08 Select and install components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.09 Adjust components such as samplers and particulate analyzers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.04.10 Comply with regulations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>25.04.11 Calibrate components such as pressure switches, regulators and transducers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.04.12 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.04.13 Document repair performed</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>		

**Task 26 - H
(cont'd)**

Learning Outcome
Maintains environmental control systems

Task 26 Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

<p>SUB-TASK 26.05</p> <p><u>Learning Objective</u> Services environmental control systems</p> <p>JP Sign-off _____</p>	<p>26.05.01 Follow preventative maintenance procedures and schedules</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.02 Identify components such as samplers, particulate analyzers, scrubbers and skimmers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.03 Follow calibration procedures</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.04 Select and use tools and equipment</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.05 Perform preventative maintenance according to OEM specifications</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>26.05.06 Calibrate components such as pressure switches, regulators and transducers</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.07 Recognize hazards such as chemicals, ultraviolet light, residue and high voltage</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.08 Clean and lubricate components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.09 Follow regulations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>26.05.10 Verify operation of serviced components</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>
	<p>25.05.11 Identify components that require repair or replacement</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.12 Verify system operation</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.13 Document service performed and required repairs</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	<p>25.05.14 Store contain, handle and dispose of hazardous materials according to regulations</p> <p>Rating ____ Complete Proof ____ <input type="checkbox"/> Use ____</p>	

APPENDIX A

INDUSTRIAL ELECTRICIAN NATIONAL OCCUPATIONAL ANALYSIS ACRONYMS

AC Alternating current

CAD Computer Assisted Drawing

CEC Canadian Electrical Code

CPU Central Processing Unit

CSA Canadian Standards Association

DC Direct current

DCS Digital Control System

EMI Electromagnetic Interference

EMT Electrical Metallic Tubing

EOL End of Line

HID High Intensity Discharge

HMI Human Machine Interface

I/O Input / Output

KVA Kilvolt-Ampere

LED Light Emitting Diode

MCC Motor Control Centre

MSDS Material Safety Data Sheet

OEM Original Equipment Manufacturers

OH&S Occupational Health and Safety

PPE Personal Protective Equipment

PLC Programmable Logic Control

PVC Polyvinyl Chloride

SAE Society of Automotive Engineers

SCR Silicone Controlled Rectifiers

TDG Transport of Dangerous Goods

TDR Time Domain Reflectometer

ULC Underwriters Laboratory Canada

UPS Uninterruptible Power Supply Systems

WHMIS Workplace Hazardous Material Information System

APPENDIX B

REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Technical Reading	<ul style="list-style-type: none"> ➤ Find and use information from one source - i.e., a book, Internet and work order ➤ Find and use information from many parts of a single source - i.e., a code book ➤ Recognize what is important from several sources of information ➤ Interpret information using more than one source ➤ Apply information to the task
Document Use	<ul style="list-style-type: none"> ➤ Use large or difficult documents which are organized into units, headings chapters, or sub-headings -i.e., a code book ➤ Find information in large or very specialized documents which may have many smaller documents - i.e., operations manuals, safety manuals ➤ Find information from many sources - i.e., code books, blueprints, work manuals ➤ Enter information into pre-set documents and forms - i.e., accident report forms, order forms ➤ Combine information from several sources and use it – i.e., alter a work order using information from code books, manuals and blueprints ➤ Create new documents using information from a variety of sources – i.e., create work orders, material lists, time logs sheets

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Writing	<ul style="list-style-type: none"> ➤ Write information into a pre-set form – i.e., contract, lease, building permit ➤ Write short messages, explanations, requests or directions – i.e., write a work order, memo, written message for a foreman, supervisor or client ➤ Write longer messages, explanations, requests or directions – i.e., write an accident report, a detailed message to a foreman, supervisor or client ➤ Write a longer article which may need to be organized into headings with a table of contents, i.e. work report, section of a work manual ➤ Write detailed, non-routine articles – i.e., make recommendations, use technical language to give directions to or ask for information from other tradespeople
Math	<ul style="list-style-type: none"> ➤ Perform math calculations using formulas, fractions, decimals and percent ➤ Combine one or more math operations to solve a problem ➤ Estimate numbers ➤ Convert between Imperial and Metric measurement systems ➤ Solve equations ➤ Use trigonometry to solve problems (not a requirement in every trade)

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Computer Use	<ul style="list-style-type: none"> ➤ Perform basic computer operations needed to produce a document – i.e., a letter ➤ Find information on the Internet ➤ Find information in workplace data bases ➤ Send and receive email ➤ Enter data into a set format – i.e., form, spreadsheet, chart ➤ Manage electronic information – i.e., save files ➤ Choose and use the best software program for the task
Oral Communication	<ul style="list-style-type: none"> ➤ Take directions from a supervisor or co-workers on work related projects ➤ Give directions to co-workers on work related projects ➤ Exchange information using trade terminology ➤ Provide details on facts ➤ Provide opinions on work related projects ➤ Organize, present and interpret ideas in a logical manner ➤ Communicate one-on-one on or in a group on complex work related matters

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Thinking Skills	<ul style="list-style-type: none"> ➤ Identify problems ➤ Apply learning from previous experiences to identify possible solutions to a problem ➤ Find, evaluate, and choose appropriate information to solve a problem ➤ Evaluate the best possible solution to a problem ➤ Make decisions ➤ Plan and organize job tasks to set time-lines ➤ Ensure quality control standards are met
Working with Others	<ul style="list-style-type: none"> ➤ Complete tasks to industry standard under supervision ➤ Complete tasks to industry standard without supervision ➤ Complete assigned tasks to meet time-lines that meet project deadlines ➤ Accept feedback ➤ Give feedback ➤ Evaluate then apply recommendations from co-workers ➤ Resolve conflict ➤ Mentor an Apprentice

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Continuous Learning	<ul style="list-style-type: none"> ➤ Identify work/career strengths and areas for improvement ➤ Develop a work/career learning plan ➤ Set goals ➤ Participate in learning opportunities to meet workplace goals ➤ Apply new learning in the workplace environment ➤ Revisit, reflect, and revise the learning plan regularly ➤ Engage in learning opportunities to keep skills current and meet career goals

