

**Performance Item**

**Tools for Improving this Skill**

**Details and Explanation For Assessment**

**Electrical Engineer - Substation Design**

**Skills**

*Objectives should be specific*

**Month 1-3**

Understanding and ability to perform three phase power, voltage, and current calculations	- Youtube vidoes	- Understand line to line voltage vs line to neutral voltage - Able to calculate current relative to voltage on primary or secondary of transformer - Able calculate power through transformer based on MVA rating
File naming conventions	- Client CAD standard - EDNE-001 A1 Storing and Naming Standard Conventions - Client One-Note CAD page	- Know the standard naming conventions for the client supported
Sharepoint Document Management System	[- Video training to be created] - EDNIE-001 A1 Storing and Naming Standard Conventions	- Understand the standard filing structure. - Know where to find the filing standard in the standards folder. - Know how to synch Sharepoint folders - Know how to check-out drawings
General Arrangements, One-Lines, and Relay One-lines	- Youtube vidoes - Lunch and learn	- Be able to identify equipment on one-line - Be able to correlate equipment on one-line to general arrangement - Be able to identify relaying zone of protection for equipment
AutoCAD basic functions	- EDNIE 010 AutoCAD Skills Matrix - On-the-job training	- Know how to update text, create lines, revision clouding, hatching, arcs, rev callouts - EDNIE-010 AutoCAD Skills Matrix
Microstation basic functions	- EDNIE-011 Microstation Skills Matrix - On-the-job training	- Know how to update text, create lines, revision clouding, hatching, arcs, rev callouts, save/update MicroStation setting changes (ie transparent on/off) - EDNIE-011 MicroStation Skills Matrix
Drawing backchecks and QA/QC Process	[- Video training to be created.] - EDNIE-004 QA/QC Process	- Understand the process for completing a back check - Understand the iterative process of updating a drawing for multiple person back checks - Be able to explain and understand what prepared, self-checked, reviewed, and backchecked drawings are
ANSI Numbering	- ASNI relay number table - Youtube training videos	- Able to identify relay types by referencing table.
Design Process and Drawing Life-cycle	- EDNIE-001 Engineering Design Proce Map - EDNIE-001 A1 Storing and Naming Standard Conventions	- Able to identify types of package issue for drawings including IFA,IFF, IFB,IFC
One-note	- Lunch and Learn: One-note and smart sheet	- Understand how to add existing note-books - Understand how to search and navigate note-books - Know how to add pages to note-books - Know where to access one-note client standards and tribal knowledge
Bluebeam REVU	- Bluebeam REVU 101 training recording in Microsoft Stream	- Know how to combine, add, remove pages from a document - Know how to highlight, markup, and add stamps to drawings - Have setup NIE profile, toolkits, and other stamps configured - Be able to login to Studio session - Be able to bundle markup sets and create bookmarks - Be able to coordinate with drafter to capture markups
Smartsheet	- Lunch and Learn - Smartsheet Deliverable List - Updating, Statusing, and Filters - Lunch and Learn: One-note and smart sheet	- Know how to navigate to project deliverable list - Know how to update and status progress - Know how to utilize filters

Outlook: Email and Scheduling	[-Email and scheduling training to be created]	<ul style="list-style-type: none"> <li>- Apply signature to email</li> <li>- Understand guidelines and principles for effective e-mail communication</li> <li>- Understand BLUF and DISC profiles in practicing good email communication</li> <li>- Setup meeting reminders on phone or other reminder method for making meetings</li> <li>- Be able to join and configure audio/video for teams calls.</li> <li>- Be able to make teams calls</li> </ul>
Panel Elevations	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Be able to create panel elevations based on standard drawings</li> <li>- Be able to modify existing panel elevation with guidance and design input of equipment to be added.</li> <li>- Be able to update bills of material on drawing and on excel sheets for added equipment</li> </ul>
<b>Month 4-6</b>		
DC Battery System and DC Calculations	<ul style="list-style-type: none"> <li>- AEP or other client DC system standard</li> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Be able identify components of DC system</li> <li>- Be able to perform a DC calculation for at least one client</li> </ul>
AC Three-line Schematics	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Be able to assemble/modify a three-line schematic based on a standard design using relay spec, relay one-lines, and other design inputs.</li> <li>- Understand phasing and ratio for voltage transformer circuits</li> <li>- Understand phasing, ratio, single point ground, and shorting switches for current circuits.</li> </ul>
DC Schematics	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Be able to create DC schematics from standard drawings using relay spec, relay one-lines, and other design inputs.</li> <li>- Be able to modify DC schematics with direction and support from senior design engineer</li> </ul>
Intermediate Wiring Design	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Be able to make interconnection between schematic and wiring</li> </ul>
Basic Relaying	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Understand the function of basic relay protection schemes including bus differential, transformer differential, feeder over current protection, and breaker failure</li> </ul>
Drawing Control	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Understand the numbering scheme and process for requesting new drawings and picking new drawing numbers</li> </ul>
<b>Month 7-9</b>		
SCADA design	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Be able to make SCADA RTU, I/O relays, and other SCADA device DC schematics using standard drawings</li> <li>- Understand the various cable types for SCADA</li> </ul>
Wiring Design	<ul style="list-style-type: none"> <li>- On-the-job training</li> <li>- Lunch and learn</li> </ul>	<ul style="list-style-type: none"> <li>- Be able to make internal panel wiring updates</li> </ul>
Drawing Control	<ul style="list-style-type: none"> <li>- On-the-job training</li> </ul>	<ul style="list-style-type: none"> <li>- Understand the project requirements and develop new drawing requests in advance of full design. Predict drawings needed based on previous designs.</li> </ul>
<b>Month 10-12</b>		
Project Development		<ul style="list-style-type: none"> <li>- Be able to take scope of work, reference design drawings, and design inputs and create project work plan</li> <li>- Identify missing design inputs</li> <li>- Understand client standards and when and where to apply for design</li> <li>- Able to start design from scratch using information above</li> </ul>

AC Calculation		- Experience completing AC calculation with support from senior engineer
AC Three-line Schematics	- On-the-job training - Lunch and learn	- Be able to assemble/modify non-standard three-line schematic based on relay spec, relay one-lines, and other design inputs.
DC Schematics	- On-the-job training - Lunch and learn	- Be able to create DC schematics for non-standard drawings using relay spec, relay one-lines, and other design inputs.
Advanced Wiring Design	- On-the-job training	- Able to interpret and create master diagrams - Able to create interconnection diagrams and cable tables - Know the various cable types - Know when to use shielded and unshielded cable