

National Cable Splicing Certification Board



Certifying Power Cable Splicers

Knowledge • Skills • Abilities

- Develop and administer a nationally recognized certification program
 - The NCSCB is not a training organization
- American Institutes For Research worked with Subject Matter Experts from across the U.S. in a variety of industries which utilize medium voltage cable
 - Developed a core knowledge certification exam that meets legal and professional standards of psychometric quality to provide a valid assessment of the job knowledge, skills and abilities needed to splice and terminate medium voltage cables
- The certification exam has two parts:
 - Written exam; covering medium voltage cable splicing & terminating of solid dielectric using manufactured kits, hand taping and paper insulated lead covered
 - Practical exam; 3 categories
 - Installing a splice, termination and separable connector on solid dielectric cable
 - Hand taped “T” splice on solid dielectric cable
 - Joint (splice) on paper insulated lead covered cable
 - Thomson Prometric will administrate & score the written exam

Personnel Certification Credential

The NCSCB follows the classical credentialing definitions in that, a personnel certification credential is meaningful when it ...

- ...is earned after demonstrating proficiency in the field of medium voltage cable splicing.
- ...is directly tied to the task of medium voltage cable splicing.
- ...has appropriate pre-qualifications.
- ...has re-certification policies.



AMERICAN INSTITUTES FOR RESEARCH®

Knowledge's Captured on the National Cable Splicing Certification Program's Core Knowledge Exam

A. Electrical Theory	
1.	Knowledge of Ohm's Law and related formulas
2.	Knowledge of resistance/impedance and its effects
3.	Knowledge of inductance and capacitance
4.	Knowledge of series, parallel, and combination circuits
5.	Knowledge of direct current (DC) theory
6.	Knowledge of alternating current (AC) theory
7.	Knowledge of system configurations (e.g., delta, wye)
8.	Knowledge of ferro-resonance and its effects in underground systems
B. Grounding	
9.	Knowledge of the principles of grounding theory
10.	Knowledge of cable systems grounding requirements
11.	Knowledge of bonding
12.	Knowledge of how conditions affect grounding (e.g., atmospheric conditions, soil conditions, building materials)
13.	Knowledge of ground conductor routing (e.g., phase ground creepage, fault indicators, shield breaks)
C. Basic Math Principles	
14.	Knowledge of how to apply basic math and measurement principles (e.g., decimals, ratios, order of operations, fractions)
D. Safety	
15.	Knowledge of hazards of energized circuits
16.	Knowledge of personal protective grounding theory and practices
17.	Knowledge of first aid
18.	Knowledge of CPR
19.	Knowledge of emergency response procedures (e.g., manhole entry procedures, pole top rescue)
20.	Knowledge of appropriate OSHA safety regulations and standards
21.	Knowledge of jobsite safety requirements (e.g., contractor, customer)
22.	Knowledge of personal protective equipment (PPE)
23.	Knowledge of proper procedures when working with hazardous materials

E. Cable Properties

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| 24. | Knowledge of cable and cable components including their electrical/mechanical functions and ratings |
| 25. | Knowledge of the care and handling of cable |
| 26. | Knowledge of the common causes of cable and cable accessory failure |
| 27. | Knowledge of how to avoid damaging cable and cable accessories |
| 28. | Knowledge of cable phasing and rotation |
| 29. | Knowledge of appropriate fire proofing procedures |
| 30. | Knowledge of effective environmental sealing techniques |

F. Cable Preparation

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| 31. | Knowledge of cutbacks and why, when, and how to make them |
| 32. | Knowledge of why, when, and how to pencil insulation |

G. Splices

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| 33. | Knowledge of types, parts, and properties of splices |
| 34. | Knowledge of electric stress control in a splice |
| 35. | Knowledge of how environmental conditions will affect splices |
| 36. | Knowledge of how to build an effective environmental seal |
| 37. | Knowledge of type, properties, and application of connectors |
| 38. | Knowledge of common causes of splice failure and how to avoid them |

H. Terminations

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| 39. | Knowledge of types, parts, and properties of terminations |
| 40. | Knowledge of electric stress control in a termination (e.g., geometric, capacitive, resistive stress control) |
| 41. | Knowledge of how environmental conditions will affect a termination |
| 42. | Knowledge of how to build an effective environmental seal for a termination |
| 43. | Knowledge of type, properties, and application of terminal connectors (e.g., pin terminals, lugs) |
| 44. | Knowledge of tracking protection (e.g., external insulation between conductor and ground) |
| 45. | Knowledge of common causes of termination failure and how to avoid |
| 46. | Knowledge of the difference between load and dead break connectors |

I. Splicing and Terminating Materials

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| 47. | Knowledge of types, properties, and appropriate application of tape |
| 48. | Knowledge of basic type of kits, kit components, and appropriate applications |
| 49. | Knowledge of the type, properties, and appropriate application of cable cleaners |
| 50. | Knowledge of type, properties, and appropriate application of other cable splicing and terminating materials (e.g., silicone grease, potting compound, oxide inhibiting compounds, sealants) |

J. Diagrams and Drawings

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| 51. | Knowledge of how to read and interpret blueprints/CAD drawings, including symbols and scales used |
| 52. | Knowledge of how to read and interpret schematic diagrams (e.g., circuit diagrams) |
| 53. | Knowledge of how to read and interpret company, engineer, or manufacturer supplied instructions |

K. Tools and Equipment

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| 54. | Knowledge of how to select and use tools and equipment |
| 55. | Knowledge of how to maintain tools and equipment |

L. Management of Cable Splicing and Terminating Tasks

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| 56. | Knowledge of scope of job |
| 57. | Knowledge of the design of the system circuits and equipment |
| 58. | Knowledge of how to select the appropriate splice, termination, or separable connector |

The following table contains the distribution of knowledge domains within the written exam.

Knowledge Area	Approximate Percent of Exam
A. Electrical Theory B. Grounding C. Basic Math Principles D. Safety	28-32%
E. Cable Properties F. Cable Preparation	22-26%
G. Splices H. Terminations I. Splicing and Terminating Materials	25-29%
J. Diagrams and Drawings K. Tools and Equipment L. Management of Cable Splicing and Terminating Tasks	17-21%

- Minimum qualifications to take the written exam is 2 years experience relating to medium voltage cable splicing & terminating
- Candidate must successfully complete written exam prior to practical exam

References:

- ANSI C119.4
- IEEE 48, 386, 404, 576, 1215, 1637
- ICEA S-94-649 & S-97-682
- Cable accessory installation instructions from manufacturers
- Handbooks & manuals from cable Manufacturers
- CRC Electrical Engineering Handbook
- OSHA 1910.269, 1926 subpart V
- NEC
- NESC
- NFPA 70E
- Lineman's and Cableman's Handbook

114 individuals have taken the written test
Passing rate 79%

63 individuals have taken the practical test
for kits
Passing rate 65.6%

NCSCB – 2008 testing Schedule

18 – 19 January

18 – 19 April

18 -19 July

18 – 19 October

Location being determined

Other testing dates available for groups of 12 or more
4 month lead time required for scheduling

Test Fee: \$245 (\$50 non-refundable application fee)

For more information & application information: <http://www.ncscb.org/about.htm>

