

LSP356

## NR-10 - Refresh – Safety for Electrical Installations and Services

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Duration</b>      | 2 days                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Target group</b>  | Industrial and maritime workers who deal directly or indirectly with electricity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Prerequisites</b> | <ul style="list-style-type: none"> <li>- RG and CPF;</li> <li>- Passport (expatriate);</li> <li>- Have a NR10 - 40hours certificate of Basic Safety for Electrical Installation and Services.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Objective</b>     | Qualify workers from industrial and maritime areas who deal directly or indirectly with electricity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Contents</b>      | <p>Theory – 16 Hours</p> <ol style="list-style-type: none"> <li>1. Risks in Facilities and Services with Electricity:             <ol style="list-style-type: none"> <li>a) Electric shock, mechanisms and effects;</li> <li>b) electric arcs; Burns and falls;</li> <li>c) Electromagnetic fields.</li> </ol> </li> <li>2. Risk Analysis Techniques;</li> <li>3. Control Measures of Electrical Risk:             <ol style="list-style-type: none"> <li>a) de-energization;</li> <li>b) functional grounding (TN/TT/IT); protection; temporary;</li> <li>c) equipotentialization;</li> <li>d) automatic feeding sectioning;</li> <li>e) leakage current devices;</li> <li>f) extra low voltage;</li> <li>g) barriers and wrappers;</li> <li>h) blockages and impediments;</li> <li>i) obstacles and bulkheads;</li> <li>j) Insulation of the living parts;</li> <li>k) double or reinforced insulation;</li> <li>l) out-of-reach placement;</li> <li>m) electrical separation.</li> </ol> </li> <li>4. Brazilian Technical Standards - NBR of ABNT: NBR-5410, NBR 14039 and others;</li> <li>5. Ministry of Labor Regulations:             <ol style="list-style-type: none"> <li>a) NR's;</li> <li>b) NR-10 (Safety in installations and services with electricity);</li> <li>c) Qualification; license, empowerment and authorization.</li> </ol> </li> <li>6. Collective Protective Equipment;</li> <li>7. Personal Protective Equipment.</li> </ol> <p>Technical Reference: NR-10, Ministry of Labor and Employment regulations and complementary jurisprudence.</p> |
| <b>Exam</b>          | Multiple choice exam with minimum passing grade of 60%.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

---

Validity: 2 years