RelyOn Nutec
360° Safety

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| Course code | OSP301 |
| Course name | Hazardous Area and Explosive Atmosphere Course |
| Duration | 16 hours |
| Target group | Industrial area and maritime workers who deal directly or indirectly in activities in hazardous area. |
| Prerequisites | - RG and CPF;<br>- Passport (Expatriate);<br>- Have more than eighteen (18) years old;<br>- Have completed high school;<br>- Certificate of good physical and mental health conditions (ASO). |
| Objective | To qualify the industrial area worker and maritime worker who deals directly or indirectly in activities in hazardous area. |
| Contents | • Introduction – Concepts;<br>• Hazardous Area;<br>• A Non-Hazardous Area;<br>• Reasons for classification of areas;<br>• Classification of hazardous areas in accordance with NBR IEC 60079;<br>• Safety in hazardous areas;<br>• Signaling in hazardous areas;<br>• Safety procedures;<br>• Explosive Atmosphere;<br>• Combustion;<br>• Fire Tetrahedron;<br>• Oxidizer;<br>• Fuel;<br>• Combustible substances;<br>• Ignition;<br>• Sources of ignition;<br>• Radiant Energies;<br>• Chain reaction;<br>• Propagation;<br>• Rate of spread;<br>• Deflagration, Explosion and Detonation;<br>• Flash point, combustion point and ignition point;<br>• Process equipment: Tanks, pressure vessels, reactors, Boilers and Silos;<br>• Risk management;<br>• Danger;<br>• Risk;<br>• Types of risks;<br>• Preventive Measures;<br>• Risk analysis;<br>• Preventive actions with flammable liquids;<br>• How to manage risks of explosions;<br>• Illustrations of some explosions;<br>• Standardization and legislation;<br>• Penalties;<br>• Responsibilities;<br>• Tables of standards;<br>• Classification of areas and its characteristics;<br>• Procedure for classifying areas;<br>• Flammability limits;<br>• Air density;<br>• Relative density of gas and steam; |

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| | • Volatility;<br>• Minimum Ignition energy;<br>• Characteristics of dusts and fibers;<br>• Maximum surface temperature;<br>• Temperature classes;<br>• Maximum temperature for dusts and fibers;<br>• Group of Explosiveness;<br>• Zones 0, 1, 2 and 20, 21, 22;<br>• Demarcation of areas;<br>• Ventilation;<br>• Electrical Equipment;<br>• Containment;<br>• Segregation;<br>• Dilution;<br>• Limitation;<br>• Suppression;<br>• Types of protective equipment;<br>• Intrinsic Safety;<br>• Explosion-proof;<br>• Don't Ignitable;<br>• No Sparkling;<br>• Restricted Breathing;<br>• Limited Power;<br>• Protected Contacts;<br>• Pressurization;<br>• Increased Security;<br>• Immersion in oil;<br>• Immersion in sand;<br>• Encapsulated;<br>• Wrapper protection;<br>• Special;<br>• Tables of types of protection according to the zones;<br>• Conventional electrical equipment specification;<br>• Ex equipment specification;<br>• Protection level-EPL;<br>• Protection level tables according to EPL;<br>• Degrees of protection IP;<br>• Additional Letter;<br>• Supplementary Letter;<br>• IK Degree of protection;<br>• Ex equipment certification;<br>• Inspection of hazardous areas;<br>• Ex equipment repairs.<br><br>Technical Reference: ABNT NBR IEC 60079-10-1, NR-20, NBR 15662, NR-10, NR-33, Portaria INMETRO 179/2010, ABNT NBR IEC 60079-17, ABNT NBR IEC 60079-19, ABNT NBR IEC 60079-0, ABNT NBR IEC 60079-14, ABNT NBR IEC 62262, ABNT NBR IEC 60529. |
| Exam | Multiple choice exam with minimum passing grade of 60%.<br><br>Validity: N/A |