

# QC Electrical Coordination Studies Checklist

## Section 26.05.73.16

<p>Approved overcurrent protective device coordination study report is signed, dated, and sealed by a professional engineer licensed in the project state before final approval of distribution equipment submittals; evidence: sealed PDF title page plus transmittal log.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Coordination-study input data sheets are complete only after approval of protective-device submittals and use equipment designation tags identical to one-line diagrams, equipment labels, and settings sheets; evidence: tagged input sheets plus one-line cross-reference.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Study begins at the service and extends to normal-system low-voltage load buses where fault current is 10 kA or less, unless an approved project-specific limit is documented; evidence: scope statement plus one-line markup.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Equipment rated 240 V ac or less is excluded from the study only when supplied by a single transformer rated less than 125 kVA and the exclusion is listed in the report; evidence: exclusion schedule plus transformer nameplate data.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">FTQ</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: red; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Study models normal and alternate power sources and all switching configurations that could result in maximum fault conditions or different selective-coordination outcomes; evidence: scenario list plus case printouts.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Coordination study software is commercially developed for power-system analysis, certifies compliance with IEEE 242 and IEEE 399, and is capable of plotting time-current-characteristic curves; evidence: software certificate plus version screenshot.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Manual calculations are not used for the final study; evidence: study narrative identifies software engine, version, and calculation basis.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Time-current coordination curves include the utility upstream device, relays, medium- and low-voltage fuses, low-voltage circuit-breaker trip devices, transformer inrush and through-fault curves, conductor damage curves, ground-fault devices, motor-starting characteristics, generator decrement/damage points, and the largest feeder breaker in each MCC and panelboard where applicable; evidence: indexed curve set plus legend.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">FTQ</span> <span style="background-color: #90EE90; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Recommended settings are reported ready for field application using manufacturer data sheets where available, including CT ratio and tap, time dial, instantaneous pickup, and long-time/short-time/ground-fault settings as applicable; evidence: settings sheets plus study appendix.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">FTQ</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: red; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Series-rated devices used for coordination are the exact listed upstream-downstream pair and installation condition documented in the study and comply with NFPA 70 and UL 489; evidence: listing sheets plus field device photos.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Transformer primary protective devices are coordinated so they do not operate on inrush current, rated full-load current, or permissible transformer overloads, and they protect transformers in accordance with IEEE C57.12.00 and IEEE C57.96; evidence: curve overlay plus transformer data sheet.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Motor protection settings follow IEEE 242 and NFPA 70 for low-voltage motors and IEEE 620 for motors served above 600 V where applicable; evidence: motor schedule plus coordination report pages.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Conductor protection demonstrates cables withstand maximum short-circuit current for a duration equal to relay trip time or total fuse clearing time in accordance with ICEA P-32-382, ICEA P-45-482, and IEEE 242; evidence: damage-curve overlay plus cable data table.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">FTQ</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: red; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Load-flow and voltage-drop study is performed twice: once at full-load currents and once at 80 percent of design capacity of load buses, and overloaded components or undervoltage buses are identified; evidence: two-case report output plus exception log.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Motor-starting study is performed for significant motors and documents light flicker and voltage sags so operation of other utilization equipment is not adversely affected; evidence: voltage-profile report plus motor-starting case printout.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Field adjustment of relays and adjustable protective devices follows recommended study settings and is completed by qualified personnel under the startup/testing contract portion; evidence: signed settings log plus technician credentials.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Each visual, mechanical, and electrical inspection for adjustable overcurrent protective devices is performed in accordance with NETA ATS and certifies compliance with test parameters; evidence: NETA test forms plus instrument ID and calibration due date.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>
<p>Final closeout package includes the final one-line diagram, final coordination study, coordination data files, list of all protective-device settings, and time-current coordination curves in the O&amp;M manuals; evidence: closeout index plus transmittal.</p> <p>Observations</p>	<div style="display: flex; align-items: center; gap: 10px;"> <span style="background-color: green; color: white; padding: 2px 5px; border-radius: 3px;">✓</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">QC</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">OPN</span> <span style="background-color: #ccc; padding: 2px 5px; border-radius: 3px;">NA</span> <span style="font-size: 1em;">📷</span> <span style="font-size: 1em;">☰</span> </div>