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Sommario/riassunto	The application of high-resistance neutral grounding (HRNG) to medium-voltage systems is one of the least understood and often misapplied methods of system neutral grounding. An HRNG grounded system is the only intention ally grounded neutral grounding method suitable for industrial systems that allows normal operation (no voltage dips, no power surges, no shutdowns, minim al damage) for an indefinite time period after the inception of the most common of all faults, the single-line-to-ground fault. The complexity of applying an HRNG system is due to les s er understood factors such as the relationship between system charging current, neutra lgrounding resistor let-thru current and point-of-fault ground-fault current; point-of-fault arcing voltage magnitudes; escalating arcing fault phenomena and point-of-fault energy levels, all of which are not easily determined nor eas ily estimated. This paper addresses the application of HRNG neutral grounding systems on medium-voltage industrial AC power systems. The seemingly perfect HRNG grounding system, with ground-fault current magnitudes often limited to 10 A or less, has a limited window of application on medium-voltage systems, such that when misapplied may actually place the electrical system backbone components at risk, as well as, trip the system off line due to escalating arcing faults.