Exception No. 5: The exposed surface of space heaters used to reduce condensation of moisture during shutdown periods shall not exceed 80 percent of the autoignition temperature in degrees Celsius of the gas or vapor involved when operated at rated voltage, and the maximum space heater surface temperature [based on a 40°C or higher marked ambient] shall be permanently marked on a visible nameplate mounted on the motor. Otherwise, space heaters shall be identified for Class I, Division 2 or Zone 2 locations.

Exception No. 6: A sliding contact shaft bonding device used for the purpose of maintaining the rotor at ground potential shall be permitted where the potential discharge energy is determined to be nonincendive for the application. The shaft bonding device shall be permitted to be installed on the inside or the outside of the motor.

Informational Note No. 1: It is important to consider the temperature of internal and external surfaces that might be exposed to the flammable atmosphere.

Informational Note No. 2: It is important to consider the risk of ignition due to currents arcing across discontinuities and overheating of parts in multisection enclosures of large motors and generators. Such motors and generators might need equipotential bonding jumpers across joints in the enclosure and from enclosure to ground. Where the presence of ignitible gases or vapors is suspected, clean air purging might be needed immediately prior to and during start-up periods.

Informational Note No. 3: See IEEE STD 1349, *IEEE Guide for the Application of Electric Machines in Zone 2 and Class I, Division 2 Hazardous (Classified) Locations*, for information on the application of rotating electric machines including shaft bonding devices and potential discharge energy calculations.

Informational Notes 1 and 2 identify unique issues that apply to motors in Zone 2 locations. High-inertia loads can cause increased rotor heating during starting. In addition, sparking can occur between motor housing assemblies during starting.

(D) Materials. Equipment marked Group IIC shall be permitted for applications requiring Group IIA or Group IIB equipment. Similarly, equipment marked Group IIB shall be permitted for applications requiring Group IIA equipment.

Equipment marked for a specific gas or vapor shall be permitted for applications where the specific gas or vapor may be encountered.

Informational Note: One common example combines these markings with equipment marked IIB +H2. This equipment is suitable for applications requiring Group IIA equipment, Group IIB equipment, or equipment for hydrogen atmospheres.

(E) Manufacturer's Instructions. Electrical equipment installed in hazardous (classified) locations shall be installed in accordance with the instructions (if any) provided by the manufacturer.

Δ **505.22 Increased Safety "e" Motors and Generators.** In Zone 1 locations, increased safety "e" motors and generators of all voltage ratings shall be listed for Zone 1 locations, and shall comply with all of the following:

(1) Motors shall be marked with the current ratio, I_A/I_N, and time, t_E.
(2) Motors shall have controllers marked with the model or identification number, output rating (horsepower or kilowatt), full-load amperes, starting current ratio (I_A/I_N), and time (t_E) of the motors that they are intended to protect; the controller marking shall also include the specific overload protection type (and setting, if applicable) that is listed with the motor or generator.
(3) Connections shall be made with the specific terminals listed with the motor or generator.
(4) Terminal housings shall be permitted to be of substantial, nonmetallic, nonburning material, provided an internal grounding means between the motor frame and the equipment grounding connection is incorporated within the housing.
(5) The provisions of Part III of Article 430 shall apply regardless of the voltage rating of the motor.
(6) The motors shall be protected against overload by a separate overload device that is responsive to motor current. This device shall be selected to trip or shall be rated in accordance with the listing of the motor and its overload protection.
(7) Sections 430.32(C) and 430.44 shall not apply to such motors.
(8) The motor overload protection shall not be shunted or cut out during the starting period.

Informational Note: See ANSI/UL 122001, *General Requirements for Electrical Ignition Systems for Internal Combustion Engines in Class I, Division 2 or Zone 2, Hazardous (Classified) Locations*, for information on ignition systems for reciprocating engines installed in Zone 2 hazardous (classified) locations. Reciprocating engine–driven generators, compressors, and other equipment installed in Zone 2 locations might present a risk of ignition of flammable materials associated with fuel, starting, and compression due to inadvertent release or equipment malfunction by the engine ignition system and controls.

Δ **505.26 Process Sealing.** Process-connected equipment including, but not limited to, canned pumps, submersible pumps, and flow, pressure, temperature, or analysis measurement instruments shall be sealed with a process seal to prevent the migration of process fluids from the designed containment into the external electrical system. Process-connected electrical equipment that incorporates a single process seal, such as a single compression seal, diaphragm, or tube to prevent flammable or combustible fluids from entering a conduit or cable system capable of transmitting fluids, shall be provided with an additional means to mitigate a single process seal failure. The additional means might include, but is not limited to, the following:

(1) A suitable barrier meeting the process temperature and pressure conditions to which the barrier is subjected upon failure of the single process seal. There shall be a vent or drain between the single process seal and the suitable