e) adequately ventilated buildings or enclosures, such as remote unattended and unmonitored facilities, that have insufficient means of limiting the duration of explosive gas atmospheres when they do occur.

Division 2 area classifications
Typical situations leading to a Division 2 area classification are

a) areas where flammable volatile liquids, flammable gases, or vapours are handled, processed, or used, but in which liquids, gases, or vapours are normally confined within closed containers or closed systems from which they can escape only as a result of accidental rupture or breakdown of the containers or systems or the abnormal operation of the equipment by which the liquids or gases are handled, processed, or used;
b) adequately ventilated buildings that have means of ensuring that the length of time during which abnormal operation resulting in the occurrence of explosive gas atmospheres can exist will be limited to a “short time”; and
c) most outdoor areas except those around open vents, or open vessels or sumps containing flammable liquids.

API RP 500 defines “adequate ventilation” as “ventilation (natural or artificial) that is sufficient to prevent the accumulation of significant quantities of vapour-air or gas-air mixtures in concentrations above 25% of their lower flammable limit, LFL”. Annex B of API RP 500 outlines a method for calculating the ventilation requirements for enclosed areas based on fugitive emissions.

Industry documents such as API RP 505 provide guidance on how industry interprets a “short time”.

Flammable mists may form or be present at the same time as flammable gas or vapour. In such cases, the strict application of the details in the classification Standards referenced might not be appropriate. Flammable mists can also form when liquids not considered to be a hazard due to their high flash point are released under pressure. In these cases, the classifications and details in the Standards referenced do not apply. Information on flammable mists can be found in industry Standards such as IEC 60079-10-1.

Δ **Rules J18-004, J18-006, and J18-008**
Reference material for area classification is listed in Table B18-1.

See also the Note to Rule J18-064 in this Annex.

There is an equivalency in area classifications between the Zone system and the Class/Division system as shown in Table B18-2. For equipment suitable for installation in hazardous locations, refer to Tables 18 and 18A.

Rule J18-006
Class II, Division 1 locations usually include the working areas of grain-handling and storage plants; rooms containing grinders or pulverizers, cleaners, graders, scalpers, open conveyors or spouts, open bins or hoppers, mixers or blenders, automatic or hopper scales, packing machinery, elevator heads and boots, stock distributors, dust and stock collectors (except all-metal collectors vented to the outside), and all similar dust-producing machinery and equipment in grain processing plants, starch plants, sugar pulverizing plants, malting plants, hay grinding plants, and other occupancies of similar nature; coal pulverizing plants (except where the pulverizing equipment is essentially dust-tight); all working areas where metal dusts and powders are produced, processed, handled, packed, or stored (except in tight containers); and all other similar locations where combustible dust may, under normal operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Combustible dusts that are electrically non-conducting will include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and wood flour, oil meal from beans and seeds, dried hay,

and other organic materials that may produce combustible dusts when processed or handled. Only Group E dusts are considered electrically conductive for the purposes of classification. Metallic dusts of magnesium, aluminum, and aluminum bronze are particularly hazardous, and every precaution should be taken to avoid ignition and explosion.

Class II, Division 2 locations include those in which dangerous concentrations of suspended dust are not likely, but where dust accumulation might form on, in, or in the vicinity of electrical equipment, and include rooms and areas containing only closed spouting and conveyors, closed bins or hoppers, or machines and equipment from which appreciable quantities of dust might escape only under abnormal conditions; rooms or areas adjacent to Class II, Division 1 locations and into which explosive or ignitable concentrations of suspended dust might be communicated only under abnormal operating conditions; rooms or areas where the formulation of explosive or ignitable concentrations of suspended dust is prevented by the operation of effective dust control equipment; warehouses and shipping rooms in which dust-producing materials are stored or handled only in bags or containers; and other similar locations.

There are many dusts, such as fine sulphur dust, that cannot be equated specifically to dusts mentioned above, and in a number of cases further information may be obtained by reference to Standards included in the NFPA *National Fire Codes*; for example, NFPA 655 gives information on prevention of sulphur fires and explosions and makes reference to electrical wiring and equipment.

Rule J18-008

Class III, Division 1 locations include parts of rayon, cotton, and other textile mills; combustible fibre manufacturing and processing plants; cotton gins and cotton-seed mills; flax processing plants; clothing manufacturing plants; woodworking plants; and establishments and industries involving similar hazardous processes or conditions.

Readily ignitable fibres and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fibre, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

Rule J18-010

Maintaining electrical installation safety in hazardous locations is dependent on a regimen of regular maintenance that will ensure that the electrical installation continues to provide safety throughout its life. Maintenance personnel are cautioned that modifications to original equipment or substitution of original components may void certification. In addition to the manufacturer's instructions, the following documents may be used to guide owners and operators of hazardous locations in developing appropriate maintenance procedures:

a) IEC 60079-17, *Explosive atmospheres — Part 17: Electrical installations inspection and maintenance*;
b) IEC 60300 series of Standards, *Dependability management*;
c) IEEE 902, *IEEE Guide for Maintenance, Operation, and Safety of Industrial and Commercial Power Systems*; and
d) NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*.

Rules J18-050 and J18-066

Table 18 provides a summary of what equipment types are suitable for installation in the various hazardous locations.

It should be noted that battery-operated and self-generating equipment is not excluded from the Rules of Annex J18, regardless of the voltage involved. Examples of such equipment are flashlights, transceivers, paging receivers, tape recorders, combustion gas detectors, vibration monitors, tachometers, battery- or voice-powered telephones, and portable test equipment that may be carried into or located within a hazardous area. Such equipment may be eligible for approval under CAN/CSA-C22.2 No. 157.