



## **\*\*CSRMA ALERT\*\***

### **SEWER INSPECTION CAMERAS: CalOSHA APPROVAL REQUIREMENTS - Is Yours Approved?**

On 27 March 2001, the California Division of Occupational Safety and Health (CalOSHA) issued a memorandum explaining California's electrical safety order requirements for the safe use of electrical cameras to inspect sewers and storm drains. CalOSHA's position relative to approval of electrical equipment to be used by employees in "unknown" sewer environments is not new. In a 15 January 1997 letter to James M. Kennedy, Vice President, Sales and Marketing, Pearpoint, Inc., and in a 20 May 1998 letter to Paul Stenzler, Vice President, Sales and Applications, Cues, Inc., CalOSHA stated that it considered "unknown sewer environments to be hazardous, classified locations defined by Electrical Safety Order Section 2540.1 as a location in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures."

CalOSHA prepared a detailed letter to users and manufacturers of sewer televising equipment to better explain their position on "APPROVED SEWER INSPECTION CAMERAS". This Q&A is a summary of that letter. For the full text of the letter, please visit [http://www.dir.ca.gov/dosh/dosh\\_publications/ElectSewerInsp.pdf](http://www.dir.ca.gov/dosh/dosh_publications/ElectSewerInsp.pdf).

#### **Can I Be Cited and Fined by CalOSHA for Using an Unapproved Electrical Sewer Inspection Camera?**

**YES** - CalOSHA believes that approval of electrical cameras used for the inspection of sewers and storm drains is required under the general approval requirement set forth in Title 8 of the California Code of Regulations, Section 2305.4. Despite a lack of awareness about the Title 8 approval requirements for electrical equipment in the past, CalOSHA believes that it is now incumbent on all users of electrical sewer inspection cameras in California to recognize the electrical equipment approval requirements found in Title 8 of the California Code of Regulations and to comply with those requirements for the protection of human life in the workplace.

When CalOSHA conducts any investigation of a California place of employment, prompted by the receipt of a complaint, or the occurrence of an employee injury, they are under a mandatory statutory duty to issue a citation to the employer when the employer is found to have violated "any standard, rule, order or regulation ... " adopted by the Standards Board.

#### **Does Title 8 Require Electrical Sewer Inspection Cameras to be Approved?**

**YES** - In Title 8, there are at least three (3) approval requirements with potential for application to the use of electrical equipment and installations in sewers and storm drains. These approval requirements are found in Section 2305.4 and are described below:

##### **1. "General" Approval Requirement -- Section 2305.4**

Section 2305.4 requires all conductors and equipment covered to be approved. "Approved" is defined in the section as "approved, listed, labeled, or certified as conforming to applicable governmental or other nationally recognized standards, or applicable scientific principles".

##### **2. "Water Safety" Approval Requirement -- Section 2340.11**

The second approval standard is found at section 2340.11 ("Deteriorating Agents") in Article 4 ("Requirements for Electrical Installations"), which states that:

- (a) Unless approved for the purpose, no conductors or equipment shall be:
- (1) Located in damp or wet locations.
  - (2) Exposed to gases, fumes or vapors, liquids, or other agents which could have a deteriorating effect.
  - (3) Exposed to excessive temperatures.

##### **3. "Fire Safety" Approval Requirement -- Section 2540.2**

The third approval standard is found at section 2540.2 ("General") in Article 59 ("Hazardous [Classified] Locations"). Section 2540.2(a) and (b) provide:

- (a) Approval. Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present. (Title 24, Part 3, Section 3-

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500-2(a.)

- (b) Intrinsically safe equipment. Equipment and associated wiring approved as intrinsically safe shall be permitted in any hazardous (classified) location for which it is approved. Intrinsically safe equipment and wiring shall not be capable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration. Abnormal conditions shall include accidental damage to any field-installed wiring, failure of electrical components, application of over-voltage, adjustment and maintenance operations, and other similar conditions. (Title 24, Part 3, Section 3-500-1(b).)"

In addition, section 2540.3 ("Electrical installations") provides "Equipment, wiring methods and installations of equipment in classified locations shall be one or more of the following:

- (a) Intrinsically safe.
- (b) Approved for the classified location.
- (c) Of a type and design which provides protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts or fibers."

### **Does the "Water Safety" Approval Requirement in Section 2340.11 Apply to Electrical Cameras Used to Inspect Sewers?**

**YES** - The water safety approval requirement applies to sewer inspection cameras whenever they are used in sewers, or any other environments that are wet or damp.

### **Does the "Fire Safety" Approval Requirement in Section 2540.2 Apply to Electrical Cameras Used to Inspect Sewers?**

**DEPENDS** - The application of the fire safety approval requirement to sewer inspection cameras depends on whether they are used in environments that are considered to be "classified" pursuant to section 2540.1.16. CalOSHA believes that an unknown sewer environment fits the definition of a Class I, Division I environment. Therefore, electrical equipment to be used in such an environment must have an approval in compliance with sections 2540.2 and 2540.3. If a sewer environment is adequately tested and monitored to demonstrate the absence of a fire hazard to the worker, it is no longer considered to be an unknown sewer environment or a Class I Division I environment. Sewer cameras used in such environments will not require fire safety approval but will still require general approval pursuant to section 2305.4.

### **Given the Title 8 Electrical Equipment Approval Requirements, What Are My Options for Compliance With the Title 8 Approval Requirements?**

#### **Option 1: NRTL Approval**

Pursuant to section 2304.5, you can use a sewer inspection camera approved for Class I, Division 1 conditions and wet or damp environments by a Nationally Recognized Testing Laboratory ("NRTL").

#### **Option 2: Electrical Engineer Approval**

Pursuant to section 2305.4, you can use a sewer inspection camera approved for Class I, Division 1 conditions and for use in wet or damp environments by an appropriate licensed electrical engineer.

#### **Option 3: Engineer Approval for Conditional Uses**

Pursuant to section 2305.4, you can use a sewer inspection camera conditionally approved by an appropriate licensed electrical engineer. Conditional approvals must address the water safety and fire safety issues raised by the use of sewer cameras:

#### **→ Water Safety Conditional Approvals.**

A water safety conditional approval can be issued by an appropriate licensed electrical engineer upon that professional's determination that the sewer camera will be safe for use in wet or damp environments subject to the user meeting specified conditions.

#### **→ Fire Safety Conditional Approvals.**

A fire safety conditional approval can be issued by an appropriate licensed electrical engineer for use of a sewer camera in areas of a sewer that have been demonstrated by testing and monitoring not to fall under the fire safety approval requirement. Testing and monitoring will be considered by CalOSHA to be sufficient for this purpose if all measurements indicate that the sewer atmosphere is below 10% of the lower explosive limit (LEL) and if the user meets all of the following additional conditions:

1. Before each use, inspect cables and electrical equipment for damage or wear that could compromise safety;

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2. Test operate the sewer camera and associated electrical equipment in a dry location away from any potential exposure to hazardous conditions to determine whether the equipment functions normally and without any problems, such as sparking, loose connections, or other similar safety problems;
3. Test for the existence of a hazardous atmosphere prior to opening any sewer access point using a multi-gas tester, and before energizing the equipment, conduct a test of the sewer atmosphere at the access point estimated to be closest to the endpoint of the camera work;
4. Provide continuous monitoring in the alarm mode at the access point from which the work is performed at all times while the sewer inspection camera is energized in the sewer;
5. De-energize all electrical equipment and use mechanical ventilation if a measurement exceeding 10% of the LEL is obtained; and
6. Discontinue use of all electrical equipment if the sewer environment cannot be maintained below 10% of the LEL.

### **How Can I Get Help if I Need More Information or Assistance?**

If you have additional questions regarding California's electrical safety orders, or their application to electrical camera equipment installations, or need assistance in complying with Title 8 approval requirements, please contact the Division's Research and Standards Safety Unit in San Francisco at (415) 703-5100, or in Anaheim at (714) 939-8478.