Canadian Standards Association
Mississauga, Ontario
**To the Part I Committee**

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Subject No. 3113 Chair: G. Lobay Date: October 27, 2004

Title: Use of Rigid PVC, Rules 20-004(11) and 20-504(5)

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**Submitted by:** Martin J. Bohn of High Line Minuteman Electrical Constructors Ltd., 14608 123 Avenue, Edmonton, Alberta, T5L 2Y3, (780) 452-8900 on March 12, 2003.

**Proposal:** Amend Rules 20-004(11) and 20-504(5) as follows:

**1. Add to Rule 20-004**

(11) Notwithstanding Rule (8) rigid PVC conduit shall be permitted for Class 1 Zone 1 wiring when installed in the earth, or poured concrete floor slabs, or masonry walls where such areas are classified.

**2. Add to Rule 20-504**

(5) Notwithstanding Rule (2) rigid PVC conduit shall be permitted for Class 1 Zone 1 wiring when installed in the earth, or pour concrete floor slabs, or masonry walls where such areas are classified.

**Reasons for Request:**
We question the logic in using rigid steel conduit in Class 1 Zone 1 areas in the earth or in the concrete slab of an aircraft hanger Rule 20-505(2) or Rule 20-004(1). The following are a number of points that we would like to make.

1. Rigid PVC conduit would serve the same purpose with less chance of fuel leaking into the conduit by virtue of it being glued at all couplings to provide a continuous conduit. The only weak point would be where the PVC conduit is adapted to rigid steel conduit prior to leaving the earth or concrete slab.
2. Rigid steel conduit will rust and in time will be full of holes thus allowing the fuel to seep into the raceway. If there was something to ignite the fuel, the conduit would blow apart much the same as rigid PVC conduit.
3. There is little chance of an explosion in the earth due to a lack of oxygen and sparks to ignite the vapours. Once fuel has filtered through concrete or soil there would be very little volatile vapour left in the fuel.
4. With all the environmental impacts on fuel spills today, companies would have to quickly clean up any major fuel spill to prevent pollution of the earth. If it was determined that the earth was contaminated, they may have to clean up the contaminated area.

5. Rigid PVC conduit will not deteriorate in the earth and will provide a usable raceway system for many years allowing changes to be made in the wiring as technology changes.

**Subcommittee Deliberations:**
There was no consensus: Three were in favour, six were not. There were five non-responders.

Of the three who agreed, there was just one comment that there should be a Part II requirement to assess PVC conduit and fittings for this type of service.

The dissenters made the following points:

- No substantiation that the glue would be suitable for the application (concerns about degradation of the glue by the fuel);

- No substantiation of the assertion that the steel will rust out in time;
- No substantiation that the likelihood of an explosion is low in the underground environment;
- This issue needs to be handled in a consistent manner (not just for gasoline dispensing) so it would more appropriately be handled by Section 18. In other words, if this wiring method would be suitable for underground applications below classified areas, why restrict it to gasoline dispensing in particular?
- The NEC does allow the use of PVC (NEC 501-4, 511-4, 514-8 and 515-5) but this topic needs to be handled by Section 18;
- The proposal does not go far enough in setting minimum cover requirements and transition requirements between PVC and steel conduit as it extends above grade;
- Who can prove that the sealing is good?
  Is it sure that the glue is doing the job?
  Is there any PVC-Rigid Adapter approved for the location?
- The proposal doesn't mention how the change over from PVC to metal with sealing fitting can best be achieved.

The Section 20 Chair wishes to add that Subject 2038 dealt with the same issue, and that proposal was rejected and closed by Part I. If anyone wants to review it, it is in the Section 20 area of the SDOW (closed subjects). At that time, another rationale that was given was:

> The wiring method of choice is now cable (eg Teck) which is suitable for direct earth burial as well as hazardous locations, and it may not be worthwhile to introduce a change to the Code permitting alternate wiring methods which no one would use anyway.

In any event, the Section 20 Chair feels that this topic would have to be handled by Section 18 rather than by Section 20. If the submitter wishes that Section 18 have a go at it, the option is always available.

**Subcommittee Recommendation:**
Reject the proposal and close the Subject.