April 1962 Vol. 2, No. 1.

The Electrical Inspectors' Association
------- NEWS LETTER -------

Eric Ramsden Co Editors Clarence Dresser

YOUR PRESIDENT has requested us to carry on with the News Letter which was started last year; but was discontinued because of poor response. This year we propose to carry on in spite of your previous no comment attitude. We propose to pass on comments, ideas and suggestions pertaining to the association and its members which we will obtain by devious methods; and wish to state at the outset that opinions stated in these news letters are not necessarily those of the editors, this is one of the reasons why we have two editors with considerable experience as buck passers.

The News Letter is aimed at and is mainly for the benefit of those members that cannot attend regular meetings and we will try to pass on to you as much of the pros and cons of what is going on as we see it and as we hear it - so watch it - we have spies out. You will probably find some of the stuff provocative - we hope you do because we want comments from you good or bad, which will be passed on as received. You can even use a non de plume if you wish but you must sign the letter.

THE ANNUAL CONFERENCE it was generally agreed was one of the most interesting we have ever had though it was not too well attended when compared to some of the past conferences. It was good to see a full complement over from Vancouver Island, and there seemed to be more of an optimistic outlook and more of an atmosphere of accomplishment than in the past. Probably because the first step toward qualifications for and recognition of the electrical inspector as such, has been taken; and it was generally agreed that in future meetings we should try to lean more toward the educational, and away from a lot of harangue about rules - "remember the furnace switch"?

THE FIRST REGULAR MEETING of the Friday night variety, as was asked for at the conference, was not too well attended but was certainly an interesting and informative affair and the panel very capably pointed out many of the facets of heating installations that the inspector should consider before approval, and were kept busy answering questions for some time before the members were satisfied.

There were quite a few of the regular attenders not present - I wonder why? It was a welcome sight to see our old friend Percy Pugh from Surrey on deck again. Andy Pratt was carrying the ball for New Westminster, but Burnaby, North Shore, and Fraser Valley where are you?

PARTICIPATION by ALL members is what we would like to see; and it occurs to us that we are possibly not doing enough in the line of field reports and research. For example, the question of the use of type TW wire for gas pump circuits; with all the members that we have around the province, we should be getting reports of failures if any are occuring. And with the diversity of climate, environment and industry that we have it should be possible with a little effort on our part to come up with some interesting and informative results.

I. C. I. A. REPORTS -

That the well known Code Authority who missed the code workshop the Saturday of the Conference did not have a hangover, but was really thawing pipes out on his farm.

That the six foot inspector at large seen chasing bulk milk trucks is really on official business, not just trying to get a free quart.

That a well known member of the Code Committee does not approve of the improvements in N.H.A. electrical specs.

That an ex president was seen having lunch with two other members of the association - why?

That a refugee of the north country dreams of how nice it would be to be back catching fish.

That it is now approved for the Fraser Valley Electrical Association to hold a meeting in Langley as two well known characters have now got a road map showing the way back to White Rock.

- More reports to come -

LETTERS TO THE EDITOR -

Dear Sirs:

As the new code will make one receptacle every 12 feet a must, why not let the provincial ammendments call for an approved shaver outlet in all bathrooms.

"Fat & Forty", Burnaby, B.C.

Dear Sirs:

I would like to refer to rule 12-274 (2). As this rule is not consistently used, it puts too much power in the hands of an inspector; who if he so desires can insist on the 3 ft. mentioned. I suggest that the Association try to get this rule changed so that rule 12-274 read as follows: Junction, outlet boxes, cabinets and gutters and the wiring in them shall be installed so that they are accessible without the removal of any part of the building.

"Rejected", Whalley, B.C.

Thanks for the letters fellows - keep them coming - Ed.

THE EDUCATIONAL PROGRAM is under way and you can expect to receive various briefs, excerpts from lectures, pamphlets and whatever we can lay our hands on and depending on what facilities we have access to, to get the stuff out to you.

For a start we are passing on this paper on sheath currents, which we feel is a subject that is becoming important to the inspector as the use of metallic sheathed cable increases.

The question of the current carrying capacity of single conductor metal sheathed cables has been the subject of considerable study. Information received from the National Research Council regarding this problem which is seriously complicated by the possibility of large currents flowing in the metal sheath of the single conductors.

CURRENT CARRYING CAPACITY OF SINGLE CONDUCTOR METAL SHEATHED CABLES

First, what is a free air installation. Until this question is settled the proper application of Table 1 is extremely difficult. It has been tentatively resolved by considering the new rules in Supplement R governing cable trough installations in conjunction with the old rules for open wiring, and we are now able to accept as a free air installation one in which the cables are spaced not less than one cable diameter apart, and not less than one cable diameter from the surface over which they pass, except at the points of support. This is applicable to a single layer of cables laid side by side. Having defined a free air installation we are enabled to accept the full Table 1 rating for cables so installed, provided that no sheath currents are permitted to flow.

The importance of sheath currents is much greater than has generally been realized. A sample calculation made for 250 MCM corflex cables, spaced one diameter apart as for free air installation as described above, showed the sheath currents to be approximately 35% of the current in the internal conductor. Currents of this magnitude flowing in the sheath will obviously cause overheating of the fully loaded cable, and such cables must, therefore be heavily de-rated, or the sheath current must be eliminated. Unfortunately, the length of the run has little effect upon the value of sheath currents flowing. The spacing of the cables is a far more important factor.

The most effective method of eliminating sheath currents is to install the cables so they are in contact throughout their length. By this means the voltages generated in the cable sheaths are reduced to a minimum, or to zero, and the currents accordingly are likewise reduced. An alternative method is to insulate the cable sheaths from each other and permit them to be bonded together and grounded at one end only so that no path for circulating sheath currents exists.

When this latter method is adopted the free ends of the cable sheaths will have a voltage difference between them which will depend in part upon the current carried by each conductor, upon the length of the run and upon the spacing of the cables. Voltages of the order of 3½ to 5 volts per 100 ft. run are readily obtained with fully loaded cables of No. 4/0 or larger. It is possible therefore for a maintenance electrician to get an unexpected shock from contact with the free end of an insulated cable sheath; and if this occurs while he is standing on a ladder or transformer platform it could readily result in an accident. The question of cable sheath voltages, therefore, should not be overlooked.

Where cables are installed in free air in accordance with our definition of such an installation the full Table 1 rating is permissible. Where

cables are installed in contact the de-rating factors are as follows:

For two cables in contact - 90%
For three cables in contact, one of which is a neutral - 90%
For three cables in contact - 85%
For four cables in contact, one of which is a neutral - 85%
For four or more current carrying cables in contact use the Table 2 rating. Note that these de-rating factors result from the mutual heating effect of cables upon each other. Where cables are strapped to a surface in addition to being in contact a further de-rating factor should be applied. The exact value of this factor has not been decided, but it would appear that a figure of 90% may be reasonable, and this should be applied after the application of the demand factor mentioned above.

Please address letters etc. to The Electrical

Inspectors' Newsletter, Box 54, White Rock, B.C.

or

To The Electrical Inspectors' Association at

970 Burrard St., Vancouver, 1, B.C.

We promise to return all or any material if requested.