Cable comments

Dear Sir — I read with interest the article by fire conditioners. I cables for offshore oil and gas industry (April 1985 E&P, p.304) and would like to make the following comments.

(i) BS 4066 Part 1 defines an unsuitable test to prove flame retardance. This was raised by me at the ERA symposium in 1972 and in an article in 1974 (Electrical Review, 26th April 1974) and is supported by the various cable manufacturers who introduced the modified flame propagation tests. This particular standard should therefore be withdrawn, as it is misleading and serves no useful purpose. (Likewise that part of IEC 332.)

(ii) I criticised the manufacturers’ tests which were the basis of IEC 332 Part 3 because they tend to condone bad installation practice. This test, which provides a chimney effect, is expensive and non-propagation can be proven by a very simple hot-plate test. For the quantity of cables tested and with a length of 2-5 m involved in a real fire the quantity of toxic fumes released would constitute a serious hazard. It must be remembered that many cables will give off toxic fumes when subject to heat and no flame at temperatures above 500°C. The PVC smoke problem was highlighted to me by earth fault currents in a wire armoured PVC sheathed cable. Flame retardance in these circumstances becomes irrelevant.

(iii) Fire-resistant cables as tested by IEC 331 are in my opinion a misnomer, as these cables should be described as heat resistant. In my own researches I tried to decide the temperature which could be regarded as a ‘fire temperature’ and came to the conclusion that a minimum of 1000°C should be used. Even this figure has been shown to be too low, as in some fires even copper bar had been melted.

(iv) The original ‘Pyrotenax’ cable was marketed as the only fire-resistant cable, as it had a copper sheath and magnesium-oxide insulant; again this in my opinion should have been described as heat resistant as it would fail if temperatures above the melting point of copper were created in fire conditions. I would expect that there are many situations in the oil and gas industries where fires can occur with temperatures in excess of 1000°C.

(v) It is wrong only to consider the design of cables and fire risk; in hazardous situations the complete supply and installation must be considered as an entity. The use of fire barriers, heat shields, cable route and even the ‘risk’ factor along with cable rating factors must form part of the design to ensure that cables are neither involved in fires and affected by fires in the near vicinity.

Investigations into smoke and gases produced by burning aircraft interior materials was the subject of the USA National Bureau of Standards report in 1969, which included some of the same materials as used in cables. The chamber used was 3 x 2 x 3 ft.

(vii) The difficulties in selecting materials is the use of generic terms for chemical compounds, and unless some means is found to prescribe the formulations when being tested the results cannot be valid for later applications.

(viii) I am pleased to see that the problem of smoke propagation is now beginning to take a bigger role, but it seems to me that the Common Transport has become the test centre. Like them I am also concerned about the many older installations, which were installed on the basis of inadequate guidance given in national and international standards and remain as a potential hazard. This has been shown in those fires which hit the headlines. The indiscriminate use of PVC as a protection for galvanised wire armour used in so many installations, which before its introduction would have used bare copper wire, is but one example where the cable manufacturers have fallen for a palliative and offered it to the user as a cure. The possible side effects and latent dangers only, as in the medical world, are becoming known too late to prevent some disasters in the future. — Yours faithfully,

N. FOULSHAM (M)
13 Lovelace Drive, Pyrford Woking, Surrey GU22 8QJ England
13th May 1985

Dear Sir or Madam

Dear Sir — I enjoyed your article of Sir or Madam (April 1985 E&P, p.291) and would like to congratulate Joan Emden and Jennifer Eastale on producing an excellent article that was clear and pleasant to read — a major achievement in itself, irrespective of the content! Clarity in communication is vital.

The description is not based on any knowledge of the facts and could be harmful to the reputation of BP. The Institution unreservedly withdraws the description and apologies to BP for implying that the Company is not concerned about the environment.

United we stand

Dear Sir — T.G. Ward writes (April 1985 E&P, p.278) to ask for clarification of the abbreviations for symbols and prefixes. Whereas I wholly sympathise with his and his typist’s problems, there are a few pitfalls that await over-simplification. SI (Le Systeme International d’Unites) dictates our current usage and layout of units. The prefixes are chosen controllably to avoid confusion with symbols for multiplying prefixes and lower case for dividing, thus we can distinguish between Mega (M) and milli (m), between ‘Peta’ (P) and ‘pico’ (p). This rule is, of course, immediately broken by the use of kilo (k), hecta (h) and deca (da) — not to be confused with deco (d)!

The problem of the SI seven base units, with derived units and two supplements is more difficult. A lower case ‘s’ must not be confused with the upper case ‘S’ (Siemen) for one second; likewise Kelvin must be identifiable from its prefix Kelvin. (But what do I hear you cry, about Tera and Tesla?) How also does the cheap typewriter avoid 1 metre from being a lumen (lm)?

However, T.G. Ward’s problem does not end there. Most typewriters cannot have µ and ν, the former usually becomes a lower case ‘u’, the latter a handwritten addition. The task is further complicated by the need to shift for a ‘/’, as in ‘mis’; or worse still for the indices, involving a double shift! Having thus supported T.G. Ward’s case for simplification, I would argue that pedantic accuracy is something of an English trait; and as such should be stoutly defended. Let us not let omission of apostrophes, as I am sure would t.g. ward the omission of his former usually becomes a lower case ‘u’, the latter a handwritten addition. The task is further complicated by the need to shift for a ‘/’, as in ‘mis’; or worse still for the indices, involving a double shift!

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