



Special requirements for home-charging installations are an important part of making electric vehicles safe

< environmental, safety and engineering standards formulated for use on land projects have failed to stop organisations from taking short cuts and minimising costs; there is no enforcement until it is too late. It will be worse in the case of deep-sea mining – out of sight out of mind.

Paul A Towers CEng MIET
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HEALTH AND SAFETY 1950S-STYLE

It was interesting to read in the interview with ABB's Jamie Stapleton (March 2019) of the elaborate protective measures taken for those engaged in repair and/or refurbishment of the company's transformers, including having medical teams standing by.

As a 17-year-old apprentice in 1950 working for transformer manufacturer Johnson & Philips (now long gone), we would have 30MVA, and above, transformers come in for repair after many years in the field. The transformer would be lifted out and the oil drained. We apprentices would then be lifted into the tank, hanging on to a large hook on the workshop overhead traveller and carrying two cans, one empty and one containing paraffin. We would empty the sludge in the bottom of the tank into the empty can, then clean the inside of the tank with the paraffin and rags. We wore no protective clothing other than a boiler suit. When the tank was clean, we painted the inside with red lead paint.

If, as was often the case, we were overcome with the fumes of the paraffin or the paint, we would bang on the walls of the

tank and be lifted out to sit on the workshop floor with our backs to the wall until we were sufficiently recovered to be lifted back in. Of course, we were lifted in and out several times to allow the paint to dry between coats.

How times and practices have changed.

Ray Piggott FIET
By email

IS WIRING REGS CHANGE REALLY NECESSARY?

A recent small and apparently innocuous change to the Wiring Regulations BS7671 has created time-consuming and costly work for electricians installing outdoor charging points for electric vehicles. The change in section 722 concerns TN-C-S installations fed by a protective multiple earthing (PME) supply, which has been the system of choice in the majority of British houses built in the last 30 years.

EVs are regarded as Class 1 appliances, that is, not double insulated. Due to the risk of an open-circuit neutral in the supply feed to the dwelling, which could cause exposed metalwork to become live, a charger has to be installed as a local TT system with earth rods, sometimes referred to as a 'TT island'.

Given that the government is keen to encourage electric vehicles to the extent of subsidising both cars and chargers it seems counter-productive to have teams of electricians carrying dozens of earth rods around with them and taking up to two hours extra to complete an installation, all for the extremely small risk of an open-circuit neutral.

Furthermore, there are many hundreds of caravan and motorhome owners who keep their vans on a driveway and quite happily plug their metal box into their house TN-C-S supply completely unaware of any risk.

Having served on the Wiring Regulations and various British Standards committees in the past, I know that such bodies take safety extremely seriously and will do everything possible to minimise risk in electrical installations. However, there comes a point where the risk needs to be balanced against the practicality and cost of the proposed remedies. It seems that, in this case, the Regulations have gone too far.

Colin L Astin CEng FIET
By email

Mark Coles, IET head of technical regulations, replies: The TN-C-S (PME) earthing system provides a good earthing provision for the user but, as Mr Astin states, dangerous issues can arise; for example, should an underground supply cable be damaged in the street, a person could receive a very serious electric shock when they are simply touching their vehicle while standing on the ground beside it.

The Electricity, Safety, Quality and Continuity Regulations (ESQCR) forbid the distributor, by law, from connecting the electrical supply to any metalwork in a caravan or boat. Of course, ESQCR is not legislation that applies to the user or operator of the equipment, ie the homeowner. Many caravan and motorhome owners who keep their vehicles

on a driveway do indeed plug them into a domestic supply, unaware of any risk. This is why there are special installation requirements for caravan sites, marinas and, now, electric-vehicle charging installations.

ENGINEERING OURSELVES OUT OF THE QE VALLEY

I agree with Clem Chambers that money "has become an abstract concept" (Money & Markets, March 2019) because everything is free! Everything we use or eat is either dug up or grown and comes from the earth free of charge.

The bread we eat comes from wheat we grow, the cars we drive come from metals we dig up, and the gas we use comes from stuff we extract from the Earth itself. What we pay for is people's time. The time people take to convert the metal into a car and the wheat into bread and the oil into petrol.

Today we find ourselves borrowing for more of the stuff we think we 'need'. We borrow in the form of a mortgage for our house; borrow for a car; for a phone; for a holiday; and now we are even borrowing for an education. This is bad enough at an individual level but when it is scaled up to a country it becomes toxic for all.

When a country injects money into its banks and businesses through quantitative easing, it can have an effect of improving the money flow and state of the country, but only temporarily. It's like giving a car with no petrol a push over the brow of a hill.

Let's assume we contribute individually to the economy about 45 person-years of work. If we individually consume more than this amount of time then our current lifestyle is unsustainable. Who pays for this extra time we have so innovatively 'created' and so extravagantly squandered? The answer of course is our children.

Is there a way around? Well yes, I think there is. There are three main actions necessary: austerity, innovation and engineering. We have to use the time we have left while cruising down the QE hill to put energy into the car, exceed the escape velocity, and motor up and out of the valley. Will all this be easy? Absolutely not, but if we can't engineer ourselves out, who can?

Andrew WS Ainger CEng
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By email