

Qualifying the ground source heat pump industry

THE Ground Source Heat Pump Association (GSHPA) is the trade association for those involved with the design and installation of ground source heat pump systems. These systems make use of renewable thermal energy stored in the ground, providing one of the most energy-efficient ways of heating buildings and providing hot water. They can be installed in virtually any part of the UK, using boreholes or shallow trenches or, less commonly, by extracting heat from a pond or lake. In a closed loop system, heat collecting pipes containing circulating water (with a little anti-freeze) are used to extract this stored energy through a heat pump. In some applications, the pump can be reversed in summer to provide an element of cooling.

The GSHPA, founded in 2006 and with a fast-growing company membership, has the principle aims of encouraging the growth and development of the ground source heat pump industry in the UK and assisting, encouraging and supporting the setting up and maintaining of high competence and training standards. Without proper and appropriate stand-

ards the quality of work and consumer confidence will suffer. Therefore priority has been given, as an immediate first step, in developing GSHPA training criteria that can be utilised by training organisations – this to kick start the move towards nationally accepted minimum levels of operatives' competence. Much involvement with government qualification agencies and other bodies is anticipated to bring this about.

The requirement for individuals and organisations to demonstrate that they are competent to provide quality and safe work is everywhere today, particularly in government legislation, the courts and industry. Gone are the days of self certification whereby it was sufficient to say that you could do a good job – now you have to prove it. Take the gas industry where it is illegal to employ a fitter who is not CORGI registered, or the new building regulations under which qualified electricians must be used. Third party endorsement of competence through qualifications, certification and approved training is essential and the norm.

Against the background of the need to prove competence in the new industry of ground source

BY ANDREW HOWLEY

heat pump installations, the GSHPA set up a training and standards sub-committee to look into it. There are a range of occupations, skills and organisation sizes in the industry (both domestic and commercial sectors) so it has been a complex task in setting priorities as to what to handle first. At one end there is the small installer enterprise with plumbing skills – in many cases heat pump installation is an add-on to its existing boiler business for individual domestic houses. At the other end there are specialised heat pump installer companies with all types of engineers working for mechanical and electrical (M&E) contractors on very large and sophisticated projects.

The GSHPA looked at qualification and training

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courses already available abroad and UK (but none were thought appropriate), talked with UK certification bodies that were showing interest and monitored what other renewable energy bodies were doing (such as the Solar Trade Association). It was then time to draw up some conclusions and make decisions.

It was obvious that ground source heat pumps were too large a topic to be dealt with by a single qualification or training course. Qualifications such as national vocational qualifications (NVQs) would take time to develop but would be needed. A range of certified training courses was the immediate way forward to plug the gap and the GSHPA would develop and approve the competence criteria for such courses. Such eventual courses would have to be robust, include assessment and be of sufficient duration to attract wide scale participation.

It was decided to start with 'basic level criteria' for the individual that installs the heat pump. The scope of this basic level, "is to provide assessment criteria for an average heat pump installer to install a heating-only domestic GSHP connected to horizontal closed-loop water-based ground arrays and a 'wet' underfloor heating system". This criteria, approved by GSHPA Council, is now available to any training provider and one such is currently designing a certified training course that should be available very shortly. The GSHPA will lend its assistance in explaining the criteria to any other provider and working with them to ensure that quality training is provided.

What next? The GSHPA will monitor the implementation of the basic level criteria in the early training courses and revise as necessary. It will develop other and matching sets of criteria to be used on more advanced training courses dealing with domestic hot water, connection to drilled ground exchangers, thermal testing, cooling, and ones that include system design elements. NVQs will follow.

Much work remains for the GSHPA, particularly when it is noted that all this has to interface with what is happening in the whole micro-generation arena (classed as below 45 kW thermal) and that of large construction/building activity that employs ground source heat pump systems. The government wants to ensure that micro-generation products are sold and applied properly. It backs several initiatives including Microgeneration Certification Scheme (MCS) with BRE certification for certifying contractor enterprises - heat pumps are included here and the GSHPA has been much involved in commenting on their installation standard, MIS 3005. On construction sites the requirement to obtain recognised Construction Skills Certification Scheme (CSCS) cards or equivalent, generally through NVQ qualifications, is fast becoming the only way to get onto site.

The message is very clear. Qualifications and training for those employed in the ground source heat pump industry is essential so that clients' demands for proof of competence can be met, quality installations can be delivered and the industry enjoys the highest reputation. The GSHPA is at the forefront of ensuring access to what is required by producing competence criteria and standards to be measured against.

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A proper way forward

BY BRIAN STRINGER

THE rapid UK growth of ground source heat pump installations has created a new and exciting opportunity for existing drilling contractors, manufacturers and suppliers. Some installer companies are themselves purchasing drilling equipment and bringing this work in-house rather than sub-contract - this to ensure constant drilling availability, vertical integration of all parts of the installation process, quality management and commercial advantage.

With forecasts from heat pump suppliers that the market looks set to increase by 50% year-on-year, demand for drilling will substantially rise. This will tax the ability and resources of the industry to supply trained personnel, maintain quality and continue having a good safety record. If not addressed correctly, there could be troubled times ahead with poor work, an increase in accidents and a decline in the industry's reputation. This will be to nobody's benefit so solutions have to be found now to avoid these potential problems.

It is not without parallel whereby a new application for drilling occurs and grows rapidly. In fact it happens more often than we think. In the 1980s it was mini-piling for the underpinning market. The 1990s produced horizontal directional drilling (HDD) for utility installations and, towards the end of the decade, window sampling for environmental purposes. Over the past ten years, landfill drilling for the extraction of methane has appeared and is now a sector in its own right. Soil nailing is another example of the expansion of drilling.

HDD grew up without major involvement from the traditional drilling manufacturers, contracting industry or trade association standards. It had a steep learning curve, much of which was through lack of appreciation of ground conditions, inexperienced personnel and lack of drilling knowledge amongst those new to the business. Disasters occurred; accident rates were above the norm and companies failed. Today, some 20 years later, the HDD sector overall is professional, competent and safe. There's a lesson to be learnt from the early days of HDD and one not to be repeated in the ground source sector.

Potentially, drilling for ground source heat pump installations could dwarf all the new application areas that have come along in the past 30 years. The installation business is domestic and commercial; applicable to any part of the UK; strikes all the right bells in the renewable energy sector and is attracting much investment funding. It is a mass market compared to the new specialist geotechnical, underpinning, landfill or HDD markets that have grown up.

A few words of caution, however, before people start writing cheques for drilling equipment, draw up business plans and rush to grab this seeming pot of gold. The old adage of how to make a small fortune in drilling by starting off with a large one is all too often true. Drilling is always a risk business if not led, supervised and carried out by experienced people. The ground can be unforgiving and bites back if there has been poor planning, incorrect equipment selection, inattention to detail and a gung ho attitude. Professionalism is required at all times.

UK geology within the first 150 m can be some

of the most demanding ground found anywhere, especially its softer formations, and can vary tremendously over relatively short distances and depths both in composition, structure and groundwater. Add



in a multitude of underground utility pipes and cables, historic near-surface mining, ground contamination, unexploded bombs, government regulations and you would wonder why drillers go to work! It is a highly skilled job being a UK lead driller and there are no short cuts - that is unless you have a death wish or a liking for financial ruin.

There is no need to reinvent the wheel regarding drilling standards, driller competencies and best practice. The British Drilling Association (BDA), the industry's trade association since 1976, has put most into place. Examples are: BSI and European standards; safety documents; national vocational qualifications (land drilling NVQ) for drilling operatives; CSCS construction industry cards; post qualification BDA on-site auditing of operatives; apprenticeship schemes and training, amongst many others.

There is urgent need for these standards, minimum level of competencies and codes of practice to be fully recognised, specified and adopted within the fast-developing ground source market. Early discussions are taking place between the BDA and the Ground Source Heat Pump Association as to joint co-operation on this matter. This so that everyone sings from the same hymn sheet, and that the sector draws a line in the sand as to what is accepted technically, contractually and in health and safety. Cowboy practices have no place in this market or any other drilling activity.

The greatest requirement is for skilled drilling people and the training/qualifying of those entering the market. There is a finite level of experienced UK drillers and they are like gold dust at present as the traditional drilling market is flat out. So we are seeing a new generation of prospective drillers appearing. The biggest challenge is to educate the newcomers as to best practice, appropriate skills and safety performance. It cannot be done overnight but it has to happen. The BDA drilling apprenticeship scheme is available and must be the way forward, but there is a real need for further trainers from the drilling world to assist its expansion and cater for the numbers involved.

Opportunity always breeds opportunists - those who take advantage to achieve an end, often with no regard to principles or consequences. All of us have to be on our guard against any rogue traders. However it's those who genuinely want to quality drill in this sector, but enter it inexperienced, that need proper guidance, support and training. There will be increasing ground source work for all, provided we get this right.

Brian Stringer is the national secretary at the British Drilling Association