Whether it's an apprenticeship, on-the-job updates or continuous professional development, training is key to achieving safe best practice and demonstrable competence. Brian Tinham examines some of the newer options for plant engineers, young and old

Training

Above: Roddy Mackenzie, head of SOE's membership and professional standards committee
Below: Engineering training at RAF St Athan in Wales

Setting aside the global recession, there are few subjects more in the news than engineering skills. Recent months have seen government ministers, DIUS (the Department for Innovation, Universities and Skills), EC UK, the ETB (Engineering and Technology Board), the National Skills Academy for Manufacturing, the Learning and Skills Council, as well as commercial organisations across the industry sectors – most recently including Emerson Process Management, Honeywell, Veolia Environmental Services and Toyota – all falling over one another to announce new training schemes and successes.

Why? Because training and skills matter so much – all the way from nurturing budding engineers in schools, to apprentices, time-served engineers and managers. For the latter, keeping up to date with CPD (continuous professional development) is a never-ending journey for all sorts of reasons. As Roddy Mackenzie, head of SOE's membership and professional standards committee, puts it: "We're all professional engineers and I would like to believe that the vast majority do carry out CPD – but it's them that will be caught out, if they can't prove competence when something goes wrong."

And it's not only about ensuring current best practice and competence, important though those are, but also assuring engineers of rewarding careers. And that includes financially: research just released by the Consultative Committee for Professional Management Organisations (CCPMO – a group representing eight business bodies) suggests that individuals with qualifications stand to gain £81,000 in extra earnings over the course of their careers, while those with professional engineering membership get a further £71,000 (averaging 37%).

What do we want?

All well and good, but what should engineers (apprentices and old timers alike) and employers be looking for? We all know that far too much training simply doesn't stick – for all sorts of reasons, ranging from poor teaching, to irrelevant material, or the day job just getting in the way. In fact, the National Skills Academy for Manufacturing (under SEMTA, the sector skills council for science, engineering and manufacturing) believes that, at present, less than 3% of all work-based training fulfils its potential, while up to 80% fails to deliver a return on the investment made.

There's no easy answer to this, but there are some seriously useful pointers. For example, Emma Mulligan, head of business development at the National Skills Academy for Manufacturing, makes the point that her organisation is currently working with training providers, using independent quality standards to revalidate course content and how it is delivered. So far, the academy has covered courses on manufacturing business improvement, productivity, lean manufacturing and engineering updates for fitters. "We're also launching a learning management web portal this year to help employers work out what skills they need," says Mulligan.

Which links to the first of the pointers for making sure that training works for you. CNES (Corus Northern Engineering Services), the engineering services group within Corus, is putting its faith in so-called e-learning (CD-ROMs, Internet, Intranet and audio/voiceover) courses – in its case, covering subjects such as materials handling, project management, risk assessment, ATEX/DSEAR, condition monitoring, and health and safety.

Why? Because, according to Corus' Nick O'Hara, business development engineer,

matters

professional training at CNES, this approach is active, student-centred and more consistent.

O'Hara insists that it's not about shoving a training video in front of employees. "Studies into learning have shown that around 10% of what we read, we actually remember. 20% of what we hear, we remember. 30% of what we see, we remember. 40% of what we see and do, we remember. 50% of what we see and hear, we remember. But 80% of what we say, we remember, and 90% of what we say and do we remember," he explains.

Others agree and are also now delivering e-learning. LEEA (the Lifting Equipment Engineers Association), for example, launched its online training portal late last year for employees of member companies around the world – saying that its new service would provide faster and more flexible support for students working towards LEEA's industry-standard diploma for engineers responsible for statutory thorough examination of lifting equipment. Ultimately, its system will incorporate instant on-line marking.

Fit for purpose

But here's a second key training point. As O'Hara puts it: "Our training providers are practising engineers. Every course we deliver, Corus has been through the pains of meeting that particular bit of legislation, or whatever it is, itself. So we think this gives us an edge when it comes to providing training to others. We know what's practical."

It's worth noting the importance of Corus' two key observations – and ensuring that your training provider lives up to both. It's also essential to ensure that your outcome requirements are fully met. Do you want passed examinations for well recognised engineering disciplines at accepted levels? In this case, you need to check that courses have been independently validated, ideally by an organisation like the National Skills Academy or, better yet, SOE. At the other extreme, is this about hands-on industry- or site-specific development, updates or refresher exercises, maybe requiring plant simulations – in which case, you need specialists.

Organisations to contact include Blackburn College, Horizon Training, MCP Consulting and TTE Technical Training Group (which grew out of ICI and British Steel on Teesside). MCP, for example, runs courses on control and instrumentation, with content ranging from safe working practices to measurement systems for all the main physical parameters, calibration, testing and fault finding – as well as controller tuning and valve control systems. It's also running Johnson & Johnson's AMIS-based (asset management improvement service) Manufacturing Equipment Excellence courses, which that company says have so far realised some $75 million in engineering cost savings and cost avoidance, as well as a further $100 million in revenue uplift, due to better equipment reliability.

Rest assured, though: there do seem to be a lot more opportunities at every level, even than just 12 months ago. At the schools' end, for example, there is the new 14–19 year olds' Engineering Diploma, which differs from other qualifications, in that work experience – designed by industrial employers – is a key ingredient. As Mike Deacon, chair of the examiners for the Edexcel Engineering Diploma, explains: "Unlike its academic counterparts, the

SOE apprentice speaks out

Metronet signal technician apprentice Bradley Hawkins, who spoke at last year's SOE Industry Luncheon in London, urges all budding engineers to get on board with a reputable apprentice training scheme and to ensure that membership of a professional engineering institution is part of the end game.

Working at Metronet's Acton engineering centre in the final months of his four-year SOE-approved apprenticeship, he says: "The value of this for me is just huge. The SOE has got such a position in engineering, so it's going to set me in very good stead for my future in operations engineering. Experience alone is never enough. We all need qualifications and professional membership to prove competence."

Hawkins comes from an engineering background and says Metronet's apprenticeship training scheme has provided him with an excellent opportunity. "Rather than winding up with a £20,000 debt round my neck from university, and still having no guarantee of a job, at the end of this I will be working – and there's always more to learn."

What does he really value about Metronet's apprenticeship course? "The variety and thoroughness. For example, the job I'm training for is technical officer, but in the second and third years I was placed with experienced staff handling signals and points maintenance, as well as tasks not directly relevant to my job, such as track maintenance, failure investigations, changing equipment, such as relays and linking into the electronics side. And everything is logged for independent auditors to assess."

Above: Award-winning Rachael Hoyle of BAE Systems Right: Learning with the Engineering Diploma

GSCE and A Level, the Diploma is an applied qualification, which means that at least 50% of the core learning is fulfilled through activities relevant to engineering."

Engineering Diploma

The Foundation Diploma (Level 1) is equivalent to five GCSEs at D–G grades, while the Higher Diploma (Level 2) takes that to seven GCSEs at A–C. Then there is the Advanced Diploma (Level 3). Deacon gives the example of a 30-hour unit on 'Maintaining Engineering Plants, Equipment and Systems'. "That is studied together with a 60-hour unit on instrumentation and control. With careful selection of additional and specialist learning, a full range of progression opportunities is available, including university, where UCAS views the result as equivalent to 3.5 A levels."

He suggests that diploma graduates at Levels 2 and 3 are suitable to transfer into apprenticeships to Levels 2 or 3 NVQ, while learners completing a Level 3 Diploma in Engineering have the advantage of learning how to relate science and maths to engineering. "SOE is currently working towards accreditation for the Diploma through the Engineering Council, which will give further credibility to the qualifications," he adds.

Then there's the government-funded Learning and Skills Council (LSC), which is responsible for delivering IPD (initial professional development) and CPD support for all post 16-year olds, with the exception of further education – so sixth forms and apprenticeships, as well as the recently reinvigorated 'Train to Gain' initiative. Karen Woodward, director of skills for employers at Train to Gain, explains that opportunities range from the new National Apprenticeship Service (due for launch in April to reinvigorate demand for apprentices by matching young people and adults with employers) to Train to Gain, which acts as a brokerage for employers, helping them to assess training needs and providing access to accredited trainers and funding – now with an extra £350 million from John Denham, secretary of state for DIUS.

"Train to Gain offers full funding for anyone of any age that has an essential skills need, such as literacy or numeracy," says Woodward. "So we pay for providers to come into the workplace and deliver training to Level 2, any time of the day or night – and that also now includes funding bite-size chunks, rather than whole qualifications. It's about units of qualifications up to 30 hours, designed and agreed by the Sector Skills councils. Then for Level 3 – around, for example, business improvement techniques for technicians – we offer part funding."

So much for the opportunities; let's close on what training should be all about, with some observations from Wing Commander Rob Woods, who is in charge of the Number Four School of Technical Training at RAF St Athan in Wales – delivering courses to NVQ 3 and EngTech for mechanical and electrical engineers, as well as advanced courses for more senior staff.

"For our Phase Two professional training, our mechanical engineers are taught everything they need to deal with any type of vehicle and ground support equipment, from a Land Rover to a specialist fire-fighting vehicle, as well as aircraft-related hydraulic rigs. That's maintenance, inspection, and making sure they're fit and ready for use. It's much the same for the electricians: making them fit to handle a huge variety of tasks.

"But it's not just the engineering disciplines. For us, training is about ensuring that our guys have a well-rounded, underpinning knowledge of their trade. So we don't just assess them on completion of tasks; we run our courses around the modern apprenticeship scheme, meaning they have to complete a portfolio of work and demonstrate application of their skills at their first operational unit. That's followed by independent assessment and, at the end of that, they get NVQ Level 3.

"They are also then ready for registration at EngTech through SOE, which has independently validated our courses. That's very highly valued here: it shows the attainment of a high standard, recognised by an organisation that represents the interests of engineering in the UK and abroad. For our guys, it also gives a profoundly important sense of belonging to a professional engineering body that will serve them well throughout their careers." PE

Pointers

- Less than 3% of work-based training fulfils its full potential and 80% fails to provide a good return
- So-called e-learning courses deliver better results, when and where individuals need them
- Make sure your training provider has the practical experience you require
- 'Train to Gain' is offering funding for essential skills
- For employers, 'Train to Gain' offers a brokerage service to find the right training providers