



Operator safety, wood energy, timber transport and central tyre inflation were among the topics for the Forestry Engineering Group (FEG) at Newton Rigg in October.

Doctor Geoff Freedman welcomed the 80 delegates who attended the annual FEG Symposium at Newton Rigg College near Penrith. After a brief synopsis of FEG's history and objectives, Doctor Freedman introduced the first keynote speaker and chair for the morning session Graham Gill, who is the Commission's District Manager for Kielder Forest.

Mr Gill opened his paper entitled *The Focus of Modern Forestry* by stating that the economy of the North East of England was largely underpinned by the area's forests, which produced 550,000 tonnes of timber and hosted 7 million day visitors each year. His main role was to balance recreation and the timber production from the 75% of the forest area that is owned by the Commission. Both these outputs had to be achieved in compliance with the FC Corporate plan, the objectives of the associated funding bodies, UK Forestry Standards and Strategies, UKWAS, a plethora of legislation and guidelines, and with due regard to the scenic quality and physical attributes of the area. This was truly 'multi-purpose forestry' and to manage it successfully, clear and well prioritised objectives were required.

"Different forests have different potentials: distance from population centres, drive times, accessibility, intrinsic scenic quality and landform are all relevant. In the final analysis, the various objectives are determined rather than selected," said Mr Gill. Since the traditional function of the forest engineer in timber production was well understood, he went on to outline the less well-known but never the less extensive contributions that had been, and were about to be, made by forest engineers in projects to attract tourism. They included tree-top walkways, viewpoints, mountain bike trails, water mazes, jetties, slipways and pontoons. Mr Gill concluded his paper by making the assertion that the forest engineer's understanding

of the forest environment was critical to achieving sustainable design and construction solutions essential to the successful management of a multi-purpose forest.

As a result of recent reports from New Zealand suggesting that on extremely steep sites manual felling was being used to replace harvesters as a means of reducing risk, FEG asked Jim Burns, the FC Scotland Safety Officer, to present the second paper entitled *Chainsaw versus Harvester*. Mr Burns began his paper by presenting the latest HSE accident statistics showing that the construction and agriculture (includes forestry) industries had the highest accident rates and, in spite of significant improvements over the last year, their combined fatalities accounted for more than half the total for all industry.

Mr Burns then showed graphic pictures of the outcome of chainsaw accidents, and of custom built harvester accidents. These pictures clearly illustrated that in terms of personal injuries, the harvester operator was better protected, thanks to his ROPS, FOPS and OPS cab, than was the chainsaw operator who had only his PPE. When the chainsaw operators' injuries were compared to the harvester operators', and when cognisance was taken of the fact that some eighty chainsaws would be required to achieve the same output from a site as one harvester, then the combined risk of injury to chainsaw operators would be significantly higher than that to the harvester operator. The point was made that this approach was not presented as being necessarily statistically accurate, but represented the experience-based opinion of the Commission safety officers.

Mr Burns was also concerned about the level of steep site expertise that could be sustained by chainsaw operators when they were only required to work in situations regarded as 'marginal' for machines. Mr Burns rounded off his



Accidents can happen, but purpose built harvesters still offer a safer method than felling with a chainsaw.

paper by explaining the rationale behind AFAG's recently issued safety guide entitled *Steep slope working in forestry*.

Wood energy was the third paper of the morning session and was presented by Dan Gates, the Forestry Commission's Woodfuel Information Officer, who began by reviewing the world energy markets and comparing the current prices of the various types of wood fuel with conventional fossil fuels. The review also indicated that within the EU 5.6% of all energy used is renewable, 60% of which is from biomass.

"The principal advantages of wood fuel over fossil fuels are in the areas of security of supply, price and carbon emission reduction," explained Mr Gates, "but there are other factors that contribute to the efficacy of wood as a fuel, not least of which is that it utilises 'here and now technology' and offers environmental, economic and social benefits." The paper reported that to further encourage the acceptance of wood fuel the government has carried out a microgeneration review and a rural development agenda, both of which point to the prospect of additional rural employment. The Energy from Wastes strategy was also now in place and this should help to reduce the annual figure of 8 million tonnes of wood that goes into Landfill in the UK. For its part the Commission administers the Scottish Forestry Grant Scheme for energy crops and the Scottish Biomass Capital Grant Scheme. Mr Gates concluded his paper by outlining examples of district heating schemes that were already successfully established in the Forest Enterprise Scotland area.

The final morning paper was entitled *Mountain Biking* and was presented by Martin O'Vaster who is a Forestry Commission Civil Engineer in the Pickering Office. This was augmented with a short report by Doctor Freedman on his visit to a well established mountain biking complex in Whistler, Canada.

Mr. O'Vaster began his presentation by emphasising the need for careful planning of the project prior to building the course. A prerequisite of this was to clearly identify the target users in terms of the local and national likely demand. In the past there had been a tendency to build for the more experienced riders but there was a rising need for routes which could not only challenge the experienced riders, but also accommodate the family groups by giving optional detours round the more difficult sections. To enable these options to be signposted, a colour coded grading system had been introduced along similar lines to that used on ski runs. Other factors that had to be taken into account at the design stage were the need to ensure that the 'grin factor' was evoked, that the trail fitted the topography, and that all necessary precautions were taken against trail erosion since, although funds were available for building trails, it was more difficult to source funds for subsequent maintenance.

The paper concluded with a summary of the five internationally recognised essential elements for building bike trails. These governed gradients and cross-falls and the relationship between the construction materials, the soil type, rainfall and expected usage.

Doctor Freedman rounded off the topic by giving a synopsis of a full report of his visit to Whistler in

Canada. This is a small township in Canada that relies heavily on operating as a ski resort in winter and as a mountain bike trail centre for the rest of the year. This ensures full use is made of the local rented accommodation, the ski lifts and other tourist infrastructure. The Whistler complex has developed considerable experience over the years in the design of individual jumps and features, construction techniques and the use of local materials. Access for emergency services, spectator viewing platforms for the competition courses and, on the management side, accident liability, are all part of the complex's organisational expertise.

Simon Armstrong, Timber Transport Project Manager for ConFor, chaired the afternoon session and began by presenting his paper entitled *Transport – the Profit and Loss of Forestry*.

The industry statistics that Mr Armstrong's paper addressed were that the UK forestry and timber processing industry supports 727,000 jobs and generates £26.4 billion worth of gross value through direct and indirect operations, while the UK forestry, logging and related service activities sector supports 16,000 jobs and generates £540.9 million worth of gross added value. With timber transport commonly representing 50% of the timber cost at the processor's gate, a severe economic restriction on the availability of timber is the inevitable consequence. This restriction is demonstrated by one forest management company reporting that one third of the productive forest area is beyond economic harvesting due to current transportation costs. Since statistics indicate that every pound not spent on harvesting translates into £2.56 lost to the Scottish economy and, since for each job in harvesting there are 28.5 associated downstream jobs, the seriousness of any harvesting restriction to the county's economy is immediately evident.

The paper concluded by analysing the haulage cost structure. Under the heading of legislative impacts, costs could be reduced by allowing wider use of red diesel and by increasing the GVW limit: operational efficiencies such as better logistics were currently being fully investigated by LIFT (previously known as SKOTKA), and alternative transport modes such as water and rail were also actively being assessed. Technical solutions such as alternative fuels were being considered

and, as papers to be presented later in the programme demonstrated, combined operational and technical solutions could allow in-forest haulage to be more extensively used.

Mr Armstrong concluded his paper by suggesting that, "The key to success lies in a move away from business to business competition and by moving towards a supply chain approach to competition."

Wave Tyrrell, Roads Engineer, Forestry Commission Civil Engineering, presented the second paper of the afternoon, which outlined the *RUTT (Roads Under Timber Transport)* project funded by the Scottish Transport Forum, Nottingham University and the Forestry Commission.

The study involved four main areas of investigation:

- The maintenance requirements of roads on 21 sites cross-related to their initial condition, traffic, rainfall and seasonal effects.
- The performance of both public and forestry road structures as measured by percstations set at varying depths within the road. (Percstations contain instrument packages that measure electrical conductivity and give an indication of the road's ability to resist deformation.)
- Comparisons between the effects of different mixes of road stone when subjected to use by a range of different vehicle types.
- Determination of a method for analysing transport costs that takes into account both road and vehicle generated costs.

Mr Tyrrell summarised progress on each of the four areas of work and indicated that an interim report was due to be issued in June 2007, final reports on the various topics being available between October 2007 and April 2008.

James Stronach, Product Manager for Outreach Ltd, with responsibility for the sales of Epsilon timber handling loaders, presented a paper on the use of *stabiliser interlocks on lorry loading cranes*. The paper began by explaining that lorry cranes were considered in one of two classifications; hook or piece goods cranes, designed to lift and place indivisible loads, and grabbing cranes which are the type most commonly used in timber operations. These two types are subject to different legislation that recognises log cranes have to be configured in a way that places the operator in a safer position (usually on the kingpost) while his counterpart on

the hook crane commonly operates from the ground just behind the cab. Furthermore a grabbing crane control system places more safety responsibility on the operator since he must control a higher speed capability and determine the weight being lifted. Both these factors play a major role in the stability of the loader when in use and, since the *Supply of Machinery (Safety) Regulations* demand that machines must be designed and constructed so that they can operate without the risk of overturning, recommendations are that a 40% margin of safety be the design target. In effect, this results in the need for stabilisers, particularly if the full capacity of the loader is being used when the lorry itself is not loaded, and therefore HSE and ALLMI (Association of Lorry Loader Manufacturers and Importers) along with all other advisory bodies recommend that stabilisers are always used during lifting operations. However, because of the conditions common in timber haulage, the HSE have agreed that they are a special case and it is *not* compulsory for timber lorries to use them. Mr Stronach warned that the usual caveat will apply that in the event of an accident the operator of the loader will be expected to produce a risk assessment showing sound reasons for deciding not to deploy his stabilisers.

Mr Stronach's paper then explained that it was probably due to this exemption that interlocks, which prevent a loader from operating without stabilisers being in position, are not currently compulsory. The HSE have however forwarded a proposal to BSI to make representation to the ISO for the compulsory inclusion of interlocks in the ISO Standard for all Loader Cranes. This move is in anticipation of the loader manufacturers solving the problems that the timber haulage industry have in deploying stabilisers on rough ground.

Mr Stronach concluded his paper by stating that the HSE has given the manufacturers a deadline of 2006 for this work to be completed.

Tim Liddon from the UPM-Kymmene Group presented the next paper on the topic of *low ground pressure vehicles*. Mr Liddon outlined work done employing low ground pressure vehicles in extended use on forest roads, and admitted that in spite of the apparent advantages, recent experience had not always yielded the potential benefits. The paper then examined the work already done in this area by a major haul-

age contractor and suggested that an analysis of what went wrong would be beneficial to the industry as a whole, as opposed to studying the more successful project at Carsphairn. Mr Liddon strongly made the point that the whole timber transport infrastructure should also be examined since engineering solutions cannot be expected to solve management problems.

The paper concluded that an integrated system for timber haulage that incurs no additional total costs but which redistributes costs must be established. Each link in the supply chain must anticipate the needs of the subsequent link and respond to ease the flow of timber through the system.

Frank McCulloch from Forestry Commission Civil Engineering stepped in at short notice to deliver a paper entitled *Central Tyre Inflation* that was prepared by Brian Spreen of Tire Pressure Control International Ltd. The paper recognised that Variable Tyre Pressure (VTP) had long been understood as an effective method of reducing tyre and fuel costs for the lorry owner, as well reducing lost time due to poor traction conditions. Also, road maintenance costs for the forest owner and the roads authorities are also reduced. In spite of this the up-take of the technology has been virtually non-existent in the UK. Two perceptions can be identified as reasons for this. Firstly the air connection from the vehicle chassis to the wheel hub appears to be extremely vulnerable, and secondly, the initial cost has to be borne by the lorry owner while it would seem likely that the forest owner would reap the larger benefit. The paper then outlined the detailed basis of the technology employed by the *Tireboss* system and reported on the results of trials that had led to the acceptance of the system by the major tyre manufacturers and by official government agencies in Canada. The trials also were able to identify that problems arising from the perceived vulnerability of the hub connections were largely unfounded even in forestry applications. It was further demonstrated that in the event of a connection failure, replacement of the connection was easily carried out by the driver.

The FEG 2006 Annual Symposium was closed by Doc Freedman who thanked all the speakers then inflicted them with an official FEG tie.

Jim Christie