

## DC White Latest News

A warm welcome to our latest newsletter. First things first, we have some important changes to the DC White engineering team.

We are very pleased to announce the arrival of Noel Bernatt (pictured right). Noel joins us as Operations Manager from Corac Energy Technologies, bringing with him a huge amount of experience in team management and product development.



We are sorry to say goodbye to Mike Winfield, who leaves at the end of the month, always a cheerful face about the place, he has also made a great contribution to our business over the last 6 years and we wish him well.

### New This Month

This month we are featuring our Impact Analysis service. Our experience includes the analysis of buildings, cranes, vehicles etc. On our website is a new case study.

Doug's Digest follows the impact theme discussing a traffic accident which had both cops and robbers (the crashed vehicle was a van, off to collect the loot) and technical discussion.

### Impact Analysis

DC White has many years' experience analysing different impact scenarios, in particular within the nuclear industry. This has included the analysis of dropped nuclear fuel rods, fuel casks, nuclear lifts, crane boom impacts and seismically induced impacts. Shown here is a standard, pharmaceutical vessel dropped on a corner vertically over its centre of gravity.

Analyses such as this provide detailed insight into the prediction of deformation, buckling, fracture and tensile failure and form the basis of a safety case or inform modifications and redesign. With insights such as these, we can construct exhaustive safety case arguments without needing to perform brute-force parametric analyses on every conceivable drop scenario.



If you would like to know more, visit our Impact Analysis pages on our website, call us on 01252 811641 or send us an email to [enquiries@dcwhite.co.uk](mailto:enquiries@dcwhite.co.uk)

### Doug's Digest

Impact analysis has developed dramatically over the past few years. It is these advances that have made our cars so much more crash-worthy than they used to be. 'Crash-worthy' seems to be totally wrong, but that's the term used by the industry; 'crash tolerant' sounds a lot better. Understanding how structures crumple under impact leads to better and more robust design. Passengers in a modern car can survive far more severe impacts than in a ten year old model.

When considering impact you, or rather the software, has to take account of the time it takes for a stress wave to pass through the material. In steel this wave clips along at 5.1 km per second and you might think that for all practical purposes this is close to instantaneous, but no. Material beyond the reaches of this fast-moving stress wave does not 'know' about the impact and carries on as before.

This is beautifully illustrated by a problem we worked on for the Police when a van veered off and broke through the roadside Armco barrier. It was discovered that the barrier was missing its fixing bolts about 150 metres away from the impact and the investigating officer believed this to be the root cause of the barrier's failure.

Even at 5.1 km per second, the unbolted section did not 'know' about the impact until 30 milliseconds later. Quite quick you might think - but by this time, travelling at 70 mph, the van had moved about a metre through the barrier. But the impact site still did not know about the missing bolts - that "I'm not bolted" stress wave took another 30 milliseconds to return to the point of impact, by which time the van had moved another metre - and was pretty well through the barrier.

The days of saying that impact roughly doubles the static load stresses are gone; that is too simple and probably wrong.

Best Wishes,

Doug

### To get in touch

Call: 01252 811641

Email: [enquiry@dcwhite.co.uk](mailto:enquiry@dcwhite.co.uk)

Visit our website: [www.dcwhite.co.uk](http://www.dcwhite.co.uk)