**BCFG Meeting at the CBM Hears About Simulation Centre Two Week Study Tour to the USA**

On 4th April, BCFG members attended their second one day meeting of 2002 at the new premises of the Confederation of British Metalforming in West Bromwich. The morning workshop on the topic of the numerical simulation of forging included two presentations one from the CBM Cim Centre Unit on their forthcoming five person study tour to the USA and the other by Dr. Andrezj Rosochowksi of the University of Strathclyde.

Introducing the US Study Tour, Peter Standring told the meeting that the purpose of the visit was twofold. Namely, to meet and hold discussions with representatives of the bulk and sheet metal forming industry, trade associations and academic institutions. These to identify the use and take up of numerical simulation, its perceived value and associated training material. The second goal was to present the CBM Cim Centre survey of its UK members on simulation take up. Also to obtain comments on the content/style of training material which had been developed at the CBM in the first 18 months of a two year Teaching Company project. Members of the tour included:

Guy Snape CBM Simulation Centre Manager
Ross Anderson TC Associate (sheet)
Andrew Richardson TC Associate (bulk)
Diane Mynors Academic Supervisor (Brunel University)
Peter Standring Academic Supervisor (University of Nottingham)

Visits were arranged to:

- MSP Forge - Detroit
- GP Investments - Detroit
- Metaldyne - Royal Oak, Detroit
- Plexus Systems - Detroit
- American Axle Forge - Detroit
- Forging Industry Association (FIA) - Cleveland
- Penton Media - Cleveland
- Precision Metalforming Association (PMA) - Cleveland
- Anchor Tool & Die - Cleveland
- American Society for Metals (ASM) - Cleveland
- Industrial Fastener Institute (IFI) - Cleveland
- Ohio Sate University - Columbus
- Scientific Forming Technologies Limited (SFTL) - Columbus
- Altair Systems - Detroit

Guy Snape explained the activities of the CBM Cim Centre since its establishment in 1999, the setting up of the TCS programme in 2000 and the start of a three year DTI funded Carrier Project in July 2001 to transfer the technology into the industrial sector (see www.britishmetalforming.com/html/cimu2-main.htm). A major advantage which the Cim Unit enjoyed was the use (not for commercial purposes) of a wide range of simulation software on free loan to the CBM by the vendors. These included:

| **Name** | **Application** |
|---|---|
| Autoform | Sheet |
| Copra | Section rolling |
| Deform PC Pro | Forging - 2D |
| Deform 3D | Forging |
| Dynaform | Sheet |
| Easy - 2 - Form | Forging 2D |
| Fast form | Sheet |
| Q Form 2D | Forging |
| Superform | Forging 2D/3D |
| Superforge | Forging 2D/3D |

Ross Anderson informed the meeting of the factors he had found which prevented some CBM members from investing in numerical simulation. These were: cost, running time, personnel, confidence in the software and training. One of his goals on the visit was to see if the same issues were restricting the take up of software in the USA. Ross went through three sheet metalforming case studies which CBM members had asked him to look at on the understanding that the results would be available for publication. This activity allowed Ross to learn to use the software and to include the information in generic training material which the TCS was for the industry.

Andrew Richardson explained his role as a TC Associate working on bulk metalforming. Like Ross he too had carried out a number of industrial case studies with CBM members. Again, these had been used to learn the software and be available for inclusion in the training material. This was being developed using a Computer Based Training (CBT) format for individuals working alone or in conjunction with a company based training programme. In taking the meeting through the planned training material structure, Andrew explained it was focussed on three elements, the Pre Processor, Simulation and Post Processor. Each element of required knowledge under the three headings was the subject of a separate learning module, e.g. friction and lubrication. Because the level of information relating to each module was so wide, the training material was further subdivided into: level one (get you started), level two (mix of theory and practice) and level three (how to handle the simulation process in an advanced way).

Diane Mynors concluded the presentation by saying the purpose of the USA visit was to produce useful information on which future CBM strategies regarding metalforming simulation could be based. This meant providing feedback in a report form and identifying any potential areas/methods for future collaboration. Diane stated that in addition to the written report it was very possible that a presentation on the event and its potential outcome would be made. Watch this space.

Dr. Andrzej Rosochowski gave a presentation of work he had carried out using a general simulation software package to investigate a number of interesting metalforming processes and problems. These included: the refinement of material structure by working a billet first one way and then the other in a closed system, (in this case by forcing it through a right angle die to produce massive shear deformation without final geometric change. In using software simulation tools Dr. Rosochowski said he was curious to discover what the results might be if he changed the processing variables in the package. As he showed in a number of examples the outcome was both interesting and offered potential for possible industrial exploitation.