

# British Tunnelling Society

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## NEWSLETTER October 2003

### INTRODUCTION

The new session has now started with the first meeting held on 24<sup>th</sup> September as the second afternoon session of the Underground Construction 2003 Conference at ExCel in the London Docklands. The delegates and BTS members heard papers on the construction of the Channel Tunnel Rail Link Contract 320, the Thames Tunnel, the construction of the cross passages and the treatment and placing of the chalk slurry in an adjacent quarry. The meeting was also given an update on the London Tunnels.

### NEWSLETTER

In the last, July 2003, Newsletter the history of the present sequence of Newsletters was outlined and the decision by the Committee at their May meeting that the Newsletter should be placed on the website and not sent to members with T&TI. There has been no response from members on this decision and this issue is the last to be issued with Tunnels & Tunnelling International.

**The next issue will be placed on the website in early January. If you would like to receive the Newsletter by e-mail, together with the notices of meetings, please e-mail the Secretary Gavin Bowyer on [gavin.bowyer@ice.org.uk](mailto:gavin.bowyer@ice.org.uk)**

### CHANNEL TUNNEL RAIL LINK

16<sup>th</sup> September was a milestone in the construction of the CTRL with the official opening of 74km of new alignment in Kent from Cheriton to Fawkham Junction, where trains will join the existing route into Waterloo. Eurostar trains are currently running on the new section between Cheriton and Ashford. Eurostar trains will run on the section from Ashford to Fawkham from 28<sup>th</sup> September.

Section 1 has been completed on programme and budget and will allow trains to pass through Kent at speeds up

to 300km/h. The new alignment will reduce the time through Kent by 20 minutes.

Section 2 is progressing well. On 15<sup>th</sup> September the progress on the seven drives was as follows:

|              |           |           |
|--------------|-----------|-----------|
| Contract 220 | Up line   | 5,529m    |
|              | Down line | 5,226m    |
| Contract 240 | Up line   | 2,186m    |
|              | Down line | 2,790m    |
| Contract 250 | Up line   | 3,357m    |
|              | Down line | 2,830m    |
| Contract 320 | Up line   | completed |
|              | Down line | 2,350m    |



The Down line TBM on Contract 220 after arriving at the Graham Road shaft (Courtesy of QA Photos Ltd and Rail Link Engineering)

61% of the 40km of bored tunnelling has now been driven. Since the last update, on 1<sup>st</sup> June 2003, 11.8km of tunnel have been completed. On six of the drives

between 1,600m and 2,050m have been driven in the three and a half months. Following the problems at Lavender Street on Contract 240, good progress has been achieved on the two drives.

## **BAA TERMINAL FIVE**

The two new airside road tunnels between the central area and the location of Terminal 5 have been driven by a joint venture of Morgan Est Tunnelling and Vinci Construction, of France, using a Herrenknecht EPB machine. The first 1.3km long drive was completed in December 2002 and the second was completed in late June 2003.

The 4km long storm water outfall tunnel has recently been completed. The 2.57m internal diameter tunnel was driven using a Lovat TBM with an expanded wedge block lining. The same JV completed the drive in five and a half months with an average progress in the later stages of 50m a day and a maximum progress of 70m in one day.

## **OBITUARY**

Three members of the tunnelling industry died over the summer, Roy Broadhead, Ernie Broadhouse and Tom Mulleary.

Roy Broadhead was a founder member of the BTS and was engaged in tunnelling until his premature death aged 69. Roy started his career working on Nuclear Power stations at Hinkley Point, Sizewell, Wylva, Hartlepool and Heysham. He also involved on the Redcar offshore shaft, the Tyne and Wear Metro, the Piccadilly Line Extension to Heathrow and the Channel Tunnel.

Roy quickly climbed the management tree at Taylor Woodrow and was Managing Director and later Chairman of Taylor Woodrow Civil Engineering Ltd. He had been Chairman of the Federation of Civil Engineering Contractors and was a member of the TML management board until his death.

Ernie Broadhouse joined Halcrows as an inspector in 1965 on the Channel Tunnel investigations. During his 35 years with Halcrow he had two other spells on the Channel Tunnel between 1973 and 1975 and between 1987 and 1989.

In between he worked on the Heathrow Cargo Tunnel, the Lewes Culfail Tunnel, various cable and sewer tunnels and on underground works on the Liverpool Street Station development. Ernie was one of the old brigade of inspectors who got on well with the contractors foremen and the face crews by his quiet persuasion.

Tom Mulleary started work as a miner's labourer in 1962 on the second Blackwell Tunnel before moving on

to the Victoria Line. Tom moved around the world following the tunnelling work. This took him to Sweden, Hong Kong, initially as a leading miner and later as a senior inspector with the MTRC, Singapore, Athens and Copenhagen.

In between Tom worked on the Channel Tunnel, the Jubilee Line and a number of small diameter tunnels. He was an unfailingly cheerful man with an infectious grin.

Members of the tunnelling fraternity will miss Roy, Ernie and Tom and give their condolences to their families.

As we went to press we heard of the death of Frank Connolly. There will be a short obituary in the next issue.

## **TUNNEL DESIGN AND CONSTRUCTION COURSE**

The BTS Course on Tunnel Design & Construction was held at the Royal Holloway College, Egham, from 30 June to 4 July 2003. There were 52 delegates for the full two (five days) modules with a further 34 attending one of the two modules. The course was financial successful.

## **JOINT CODE OF PRACTICE FOR RISK MANAGEMENT OF TUNNEL WORKS IN THE UK**

The Joint Code of Practice with the Association of British Insurers was launched at Underground Construction 2003. A summary of the Code will be placed on the new website. Single copies at £10 plus £2 postage from the Secretary.

## **COMMITTEE**

At the first meeting of the new Committee in June the Chairpersons of each of the Sub-Committees were appointed. The key positions are as follows:

|                                      |                |
|--------------------------------------|----------------|
| Chairman                             | Anthony Umney  |
| Vice Chairman                        | David Court    |
| Papers and meetings and Website      | Roy Slocombe   |
| Training and Education               | Bill Redhead   |
| Awards                               | Bill Grose     |
| Finance & General Purposes           | David Court    |
| Health & Safety and Standards        | Donald Lamont  |
| Technical/Design Guide               | Chris Smith    |
| Tunnelling Lobby                     | Helen Natrass  |
| T&TI Advisory Board                  | Myles O'Reilly |
| International Tunnelling Association | Martin Knights |
| Annual Dinner                        | John Scholey   |
| Newsletter                           | Rodney Craig   |
| Insurance Code of Practice           | Terry Mellors  |

If anyone wishes to contact any Sub-Committee Chairpersons they should contact the Secretary Gavin Bowyer at the above address.

## GOSSIP

Any interesting news about members to [rodneycraig@compuserve.com](mailto:rodneycraig@compuserve.com)

## FUTURE MEETINGS

All meetings start at the Institution at 17.30 unless stated. Flysheets on the details of the meetings are circulated in advance in T&TI and details are also posted on the website a month or so in advance of the meeting.

- |                                      |  |
|--------------------------------------|--|
| <b>16<sup>th</sup> October</b>       | <b>Capital Secret – The Story of the London Cable Tunnels</b>  |
| <b>20<sup>th</sup> November</b>      | <b>Crossrail Project</b>                                       |
| <b>11<sup>th</sup> December</b>      | <b>Settlements and Sinkholes in Singapore' North East Line</b> |
| <b>15<sup>th</sup> January 2004</b>  | <b>A86 West Project, Paris</b>                                 |
| <b>19<sup>th</sup> February 2004</b> | <b>Joint meeting with IMMM – Old Cliffe Hill Quarry Tunnel</b> |

## UNDERGROUND CONSTRUCTION 2003

At the time of going to press the UC 2003 Conference was about to take place. The biannual Conference and Exhibition was held at the exciting ExCel Centre in the London Docklands on 24<sup>th</sup> and 25<sup>th</sup> September.

With the active support of most of the constituent members of the Ground Forum, the Conference and Exhibition was organised by Brintex on behalf of the Institute of Materials, Minerals & Mining and the Society. It brought together the UK's ground engineering and tunnelling communities in a showcase of projects, products and services. At the time of writing some 250 delegates had registered and over 1,500 visitors expected at the exhibition.

This was a truly international event with papers and delegates from around the world and one conference session devoted to North American projects, several of which have British tunnel engineers in key posts.

A Sub-Committee of the Society and Brintex recently met to discuss an expression of interest to host the International Tunnelling Association annual meeting at

UC 2007. During the next few months this proposal will be developed and a decision taken at the Committee meeting in November whether to submit an invitation to the ITA. The decision on the host Nation will be voted on at the next annual meeting in Singapore in May 2004.

## TUNNEL LOBBY GROUP

The visit to the EDF Energy (London Electricity) Underground Substation in Leicester Square was extremely interesting. Two Parliamentarians joined the small group which composed of representatives of the BTS, UKSTT, Pipe Jacking Association and sponsors. EDF Energy's Anwar Sardiwalla led us on a fascinating tour of this important installation showing how effectively such installations can be housed underground.

We will be holding the AGM of the All Party Parliamentary Group for Underground Space on 28<sup>th</sup> October at Portcullis House. This will be a brief affair followed by a presentation. As Parliament has just convened after the summer recess, Helen Natrass is consulting Parliamentarians and the BTS to find out what topics are hot at the moment so we can plan an attractive presentation for October.

We will invite Parliamentarians to the BTS November meeting on Crossrail.

Further information from Helen Natrass [h.natrass@sir-robert-mcalpine.com](mailto:h.natrass@sir-robert-mcalpine.com)  
Tel 02078085141

## HEALTH AND SAFETY

### Closed Face Working Group

The Closed Face Working Group is a BTS Committee which reviews best practice associated with the use of Closed Face Tunnel Boring machines. In 2002 it produced a reports on the tunnel collapses at Portsmouth and Hull with a series of recommendations.

The Committee under the Chairmanship of Alastair Biggart has just commenced a review of a recent ground collapse at Lavender Street on the Channel Tunnel Rail Link and will be producing a report and recommendations with regard to tunnelling with closed face TBMs in Urban areas where there are risks of uncharted wells and anomalies.

### Nitrogen Monoxide Exposure Limit

The EC looks likely to reduce the indicative exposure limit for Nitrogen Monoxide from 25ppm to 0.2ppm in 2005. The UK will have to implement this limit unless there are very good reasons not to. This will obviously affect tunnel ventilation requirements, The HSE will shortly be seeking comments from industry and

members of the BTS may wish to consider a response to the HSE on this issue.

## **HSE Research Report**

When the change to oxygen decompression was introduced two years ago, HSE undertook to compare the Blackpool Tables + oxygen against a range of international oxygen decompression tables. This study has now been completed and the report has been published as HSE Research Report 126 'A comparison of Oxygen Decompression Tables for use in Compressed Air'. ISBN: 0 7176 2703 9. It can be downloaded from the HSE website or obtained by post from HSE Books (priced £15)

## **The Dangerous Substances and Explosive Atmospheres Regulations 2002.**

These Regulations came into force in July 2003 and are intended to eliminate or reduce risks to worker safety from fire or explosion arising from a 'dangerous substance' associated with a work activity.

A substance is 'dangerous' if, because of its physical or chemical composition properties and the way it is used at work, it creates a risk of explosion. Naturally occurring dangerous substances include methane. Diesel fuel and hydraulic fluid would not be considered dangerous when stored as bulk liquids, however they could be considered dangerous if leaked as an atomised spray. A dust which can form an explosive mixture with air would also be considered dangerous. Oxygen giving rise to enrichment of the tunnel atmosphere would also be considered a dangerous substance.

Employers are required to eliminate or reduce risk so far as is reasonably practicable in accordance with the normal hierarchy of risk control. Atmospheric monitoring, with ventilation as necessary, would be considered essential control measures. An 'explosive atmosphere' should be interpreted as being 100% LEL or above. Where the potentially explosive contaminant is kept significantly below the LEL by means of ventilation, an explosive atmosphere is not considered to be present. The guidance of BS 6164:2001 'Code of Practice for Safety in Tunnelling in the Construction Industry' on work in potentially explosive atmosphere should be adhered to.

The workplace where explosive atmosphere may occur must be in zones on the basis of the frequency and duration of the occurrence of an explosive atmosphere. Equipment and protective systems in hazardous places must comply with certain requirements set out in the regulations including use in mining or non-mining applications. The important aspect here is the classification into zones 0, 1, 2 as appropriate. The selection of equipment should primarily be on zonal suitability and not necessarily on whether the equipment

is for the correct mining/non-mining application. HSE has been advised that the definition of mining should be taken as in S180 of the Mines and Quarries Act 1954. Therefore all tunnelling and underground construction is considered a non-mining application. However, in many cases only mining equipment will be available and may be used.

The regulations do not apply to work in a compressed air tunnel. Further details can be obtained from Donald Lamont.

## **Changes to the guidance to Appointed Doctors who perform medical surveillance under the Compressed Air at Work Regulations 1996**

The Ionising Radiations (Medical Exposure) Regulations 2000(IR(ME)R 2000) have required the HSE to review the guidance on **routine** radiology in the performance of medical surveillance of people employed in compressed air, in commercial diving, and with asbestos or silica.

The IR(ME) Regulations require that medical exposure to ionising radiations should only be performed if there is a direct benefit to the person being x-rayed. The doctor ordering the X-rays must justify the exposure to radiation and may be held accountable by the General Medical Council if he does not adhere to the requirements of the Regulations.

In practice this means that **routine** radiology on a periodic basis, or before commencing work, in compressed air is no longer allowed by law and the Appointed Doctor must make an assessment on each individual based upon the medical and employment history, medical examination and other investigations. Routine chest X-rays and radiology of long bones to detect dysbaric osteonecrosis are no longer a requirement in the statutory routine medical surveillance, or pre-exposure medical examination, of compressed air workers. Appointed Doctors should consider MRI scanning as an alternative to radiology on an individual basis if imaging is required.

HSE Appointed Doctors, who perform statutory medical surveillance have been sent revised guidance and the text of Appendices 7 and 9 of the HSE publication 'A guide to the Work in Compressed Air Regulations 1996 (L96)' shall be amended to concur with advice for Appointed Doctors.

## **WORKING GROUP ON REGISTRATION**

In the July 2003 Newsletter we reported that the Committee had formed a Working Group to look at Registration of Tunnelling Professionals. The Working Group report has now been received by the Committee and was discussed at the Committee meeting held in

September 2003. Further details will be given in the next newsletter.

## **CONFERENCES**

Don't forget to look at the back pages of Tunnels & Tunnelling International and World Tunnelling for the conferences coming up over the next two years. Also the International Tunnelling Association website [www.ita-aites.org](http://www.ita-aites.org)

EFFEE 2<sup>nd</sup> World Conference on Explosives and Blasting, Prague Czech Republic , 10 to 12 September 2003; [www.explosives.cz](http://www.explosives.cz)

ITA-AITES 2004, World Tunnel Congress and 30<sup>th</sup> ITA General Assembly, Singapore 22 to 27 May 2004