

## PIPELINE INDUSTRIES GUILD

### ONSHORE TECHNICAL PANEL

MEETING OF 25<sup>TH</sup> MAY 2004 AT CRANFIELD UNIVERSITY

#### KEY POINTS

#### ATTENDEES

Bill HUGHES (Chair)	Alan THAYNE
Ernie HOLDEN	John BARR
Paul O'CONNELL	Paul GODDEN
Phil PARKINSON	

David YAPP	Cranfield University (for Stephen BLACKMAN)
Rory BISHOP	British Airports Authority

#### 1. APOLOGIES

Brian SPENCER	John COPPACK
Stephen BLACKMAN	Graham WILCOCK
Eric MARTIN	John VARDON
Jason EVANS	Roger SARGOLOGO
Richard ESPINER	Richard PRATT
Richard GRAY	Dave WILLIS
Andrew JACKSON	

#### 2. PRESENTATIONS

##### 2.1 CRANFIELD UNIVERSITY - WELDING ENGINEERING RESEARCH CENTRE

The College of Aeronautics developed from the wartime use of the airfield to become the Cranfield Institute of Technology and subsequently Cranfield University. The emphasis is on aeronautics and engineering management in giving one year, taught MSc and PhDs courses. There are 2,000 people on site + 1,000 at satellite sites at Silsoe and Shrivenham. While some research funding is provided by government, Cranfield has the third highest level of applied research funding in the UK.

The WERC is the only welding research centre in UK and will be re-starting the taught MSc course in September 2004. 80% of their work is on pipelines: the balance is for laser welding and weight reduction for aeronautics (eg A380 wing section). The WERC is heavily involved with BP's cost reduction programme in developing automated X100 welding at  $-40^{\circ}\text{C}$  for the planned Alaska gas pipeline using automated and dual wire welding (the Cranfield Automated Pipe Welding System - CAPS) to improve the speed and quality of welding and to reduce the number of welding crews and associate costs (from 16 welding stations per crew to 4). The WERC has 16 staff (including researchers).

Panel members were shown the facilities and work being undertaken on X100 and other welding developments by David YAPP of the WERC and the test rig being used to research the behaviour of slugs in three phase flow in pipe risers by Dr Hoi YEUNG (Department Of Process And Systems Engineering).

## 2.2 TUNNELLING AT HEATHROW TERMINAL 5 (BRITISH AIRPORTS AUTHORITY)

[A copy of Rory BISHOP's slides are attached at the end of this meeting note, below.]

British Airports Authority is developing Terminal 5 at Heathrow, the largest privately funded construction project in Europe. This involves driving 9 tunnels: the lowest at -26 m at crown and of 9 m, 4.5 m and 5.7 m diameter. Design predicts between 13 and 16 mm settlement at surface. The tunnels include:

- Air-side road tunnel
- Storm water outfall tunnels
- Rail tunnels (Piccadilly and Heathrow Express extensions).

Interfaces with existing rail services, a sewage treatment plant and fuel storage facilities and pipelines involve critical clearances and subsidence tolerances (eg with potential effects on pumps on fuel skids and centrifuge bearings in the sewage treatment plant).

In addition to the tunnels, construction has involved the vertical escape, ventilation and intervention shafts and horizontal access passages. These have involved top-down construction with laterals driven and lined with sprayed concrete. A vertical conveyor system was used for first time in UK removing the need for trucks.

Third Party Interfaces. Many interest groups have been involved. BAA needed to identify routes and all services: assess impacts (based on settlement): consult and carry out joint risk assessment (eg Thames Water centrifuge sensitivity and criticality to their operations – 1 to 2 mm critical): set trigger levels for acceptable settlement: define contingency plans (eg speed restriction with London Underground and potential need to suspend services): monitoring of settlement (daily or more frequently if needed) by precise levelling.

Movement has been as predicted: expected increase by further 30% over next 25 to 30 years

Cost of tunnels:

Piccadilly Extension	£30 million
Heathrow Express	£30 million
Management team	100 ±.

Soil investigation: extensive assessment at <50 m centres: concentration at gravel / clay interface. Tunnels are all through London Clay: impermeable with plastic properties: no gaskets to tunnel lining or drainage needed, nor compressed air working.

T5 planned to open 30<sup>th</sup> March 2008.

Members were invited to attend meetings of the British Tunnelling Society at ICE, London. Details can be obtained from their Secretary either on 020 7665 2233 or by e-mail at [bts@ice.org.uk](mailto:bts@ice.org.uk)

## 3. UPDATES

### 3.1 TRANS-CANADA PIPELINE INCIDENT

Nothing further to report.

### 3.2 BS8010 UPDATE

Nothing further to report currently. For further information please contact David WILLIS on 07740 467605.

#### 4. SAFETY ISSUES

##### 4.1 FATALITIES ON LNG PLANT – SKIKDA, ALGERIA [UPDATE]

There was nothing to suggest that the initial report into the accident that was due at the end of April 2004 had been issued: nothing was reported on the Internet. No further Information had been received to clarify whether the accident was caused by failure of a pipeline, not of a fired boiler.

##### 4.2 BPA: PERRY OAKS FUEL FARM: GATE COLLAPSE

Access gate at fuel farm collapsed onto and trapped (female) field operator. Gates are very heavy and their motorised operation had been changed causing the hinge to fail.

##### 4.3 VEHICLE REFUELLING INCIDENTS REPORTED BY SHELL

See attached reports (below) from Shell on the potential ignition of fuel vapours

- By static electricity and
- By the use of mobile 'phones.

##### 4.4 CABLE STRIKES AFTER USE OF CAT SCANNERS

Phil PARKINSON reported a significant number of cable strikes in the past two years when conducting borehole surveys despite working under Permit To Work controls (on a substation and a refinery) and using Cable Assessment Tool (CAT) for pre-excavation scans. These do not seem to be effective when a cable isn't energised and in some cases, clients' drawings had been inaccurate.

#### 5. TECHNICAL FORUM

Bill HUGHES had suggested to Richard GLENISTER that although no way forward had been agreed at the Technical Forum held at Birmingham Airport on 17<sup>th</sup> February 2004 this should form the basis of the Prestige Lecture for 2004 and inviting input from the Government to the debate on the implementation of a One Call System and the application of this for all buried plant rather than just major accident hazard pipelines (possibly promoted by the planned EU Directive).

#### 6. UKOPA NEWS

The note of the UKOPA meeting of 14<sup>th</sup> and 15<sup>th</sup> January 2004 circulated with Bill HUGHES' e-mail of 17<sup>th</sup> March 2004 is attached at the end of this meeting note and should be considered as confidential.

#### 7. PIG DEVELOPMENTS

Brian SPENCER had agreed to take over as Chair of the Panel from Bill HUGHES after the PIG's AGM in June 2004.

No further details were reported since Richard GLENISTER was unable to attend the meeting.

8. ANY OTHER BUSINESS  
8.1 ROLE OF THE TECHNICAL PANELS

No further developments.

8.2 TECHNICAL PAPERS / AWARDS

The prize for the Onshore Technical Paper had been awarded at the PIG London Dinner on 9<sup>th</sup> March 2004 to Fisher German for their paper "Linesearch.org".

8.3 CRYOGENIC PIPELINES

Alan THAYNE referred to the planned development of cryogenic pipelines related to the importation of liquefied natural gas (LNG) at the Isle Of Grain and Milford Haven and the technical issues that these are likely to present.

9. CONFERENCES

9.1 BP CONFERENCE – "TERRAIN AND GEOHAZARD CHALLENGES FACING ONSHORE OIL AND GAS PIPELINES"

2<sup>nd</sup> to 4<sup>th</sup> June 2004, Institute of Civil Engineers, London

Contact: Sue FRYE, ICE Conferences at [Sue.Frye@ice.org.uk](mailto:Sue.Frye@ice.org.uk) or on +44 (0)20 7233 1743.

9.2 BP / IPLOCA ONSHORE PIPELINE COST REDUCTION WORKSHOP

The joint BP / IPLOCA Workshop "*Onshore Pipeline Cost Reduction – New and Novel Construction Methods*" is to be held on 24<sup>th</sup> and 25<sup>th</sup> June 2004 Castle Hotel, Windsor, UK. Anyone wishing to attend should contact Graham FREETH at [FreethG@uk.bp.com](mailto:FreethG@uk.bp.com) or the administrator Suzy WINTERFLOOD ON +44 1932 764 023 BY 28<sup>th</sup> May 2004 (limited to 40 delegates).

10. NEXT MEETINGS

- 6<sup>th</sup> July 2004
- 12<sup>th</sup> October 2004

Venues provisionally London HQ but subject to conformation. Visits had been offered to Corus' Hartlepool mill and coating plant and to Enterprise's offices (Leeds).

It was suggested that the Panel members should join the visit to FABRICON, Holland in September 2004. John BARR was to provide details to Phil PARKINSON.

Phil PARKINSON  
26<sup>th</sup> May 2004