RCEA
(SUSSEX)

An Association for Retired Professional Engineers

NEWSLETTER March 2006

PROGRAMME OF EVENTS April – August 2006

Every Monday 10.30 am. Coffee at the Denton Lounge, Worthing Pier.

5th Apr	Wednesday	**Outing:** 2.30 pm. Newhaven Fort, Newhaven
20th Apr	Thursday	Coffee - at Spotted Cow, Angmering
27th Apr.	Thursday	Coffee - with Partners at Beach Hotel, Worthing
16th May	Tuesday	**Outing:** Michelham Priory and Gardens
18th May	Thursday	Coffee - at Spotted Cow, Angmering
25th May.	Thursday	Coffee - with Partners at Beach Hotel, Worthing
14th Jun	Wednesday	**Outing:** Harvey's Brewery, Lewes
15th Jun	Thursday	Coffee - at Spotted Cow, Angmering
29th Jun.	Thursday	Coffee - with Partners at Highdown Towers, Worthing
5th Jul	Wednesday	**Outing:** 2.30 pm**.** HMS Warrior and Visit to Spinnaker Tower, Portsmouth.
20th Jul	Thursday	Coffee - at Spotted Cow, Angmering

27th Jul.	Thursday	Coffee - with Partners at Highdown Towers, Worthing
17th Aug	Thursday	Coffee - at Spotted Cow, Angmering
31st Aug.	Thursday	Coffee - with Partners at Beach Hotel, Worthing

All Talks and Meetings will be commence at 2.30 pm and be held in the Chichester Room, Field Place, Worthing, unless another venue or time is indicated.
Timings for visits and outings will be as printed in the detailed description below.

Coffee mornings commence at 10.30 a.m., except at The Beach, which is from 10.45 a.m

Membership

2006 **KOLLER, P.** BSc(Hons) MIMechE

32 Frankton Ave Haywards Heath RH16 3QX

Peter and Cathy (01444 415795)

63-68 Student to Design Engineer AEI Trafford Park geared turbine div.

68-70 Engineer Officer Merchant Navy. 70-05 Engineer surveyor to classification manager & senior principal surveyor Lloyd's register of shipping – marine div.

Interests: Walking, Travel, History.

Website for the RCEA

For latest information log into **www.rceasussex.org.uk**

Brief Detail – Talks, Outings and Visits April – August

Outing:
Wednesday 5 April 2006, 2-30pm, Newhaven Fort, , Newhaven, East Sussex.

Built as one of a series of South Coast defences in Napoleonic times, and reinforced during later wars, Newhaven Fort has an impressive structure of massive walls, ramparts, tunnels

and gun emplacements, and its situation offers fine views of the Harbour, English Channel and the western end of the Seven Sisters chalk cliffs.
The Fort played an active part in both World Wars and is perhaps best remembered as the base for the Commando Raid on Dieppe in1942.

Newhaven Fort has been extensively adapted for its present role as a tourist attraction with many exhibits and displays recreating the atmosphere of wartime past. Further information can be found on www.newhavenfort.org.uk

Upon arrival, our visit will consist of an introductory talk followed by a guided tour. Members will then be free to explore other parts of the Fort. The on site Searchlight Café provides a range of light refreshments.

Outing:
Tuesday 16th May 2006, 2 pm, Michelham Priory and Gardens

Michelham Priory is a Tudor mansion, hidden away in the Sussex Countryside where the Cuckmere River winds between the South Downs and the Pevensey Levels. Originally an Augustinian Priory, it is set on a moated island and is surrounded by seven acres of beautiful, tranquil gardens. It has the longest medieval water-filled moat in England and the gardens are a mix of formal gardens and wilder, more natural areas.

The house, which is reputedly haunted, has been inhabited for nearly 800 years so visitors can discover how it has gradually evolved through time from an Augustinian Priory to a Tudor mansion and on to the present day. There is a forge, an interesting museum and a working watermill, which using the river Cuckmere grinds flour. There is a restaurant and a gift shop.

Our visit will start at 2 pm and the party (maximum of 30) will split into two groups. One will undertake a guided tour of the Priory and the other a guided tour of the gardens. The groups will then swap around after their respective tours. Each tour will take about an hour.

Directions:- Michelham Priory is situated in Upper Dicker, approximately. 2 miles west of Hailsham and 8 miles north west of Eastbourne. From the Brighton direction use the A27 to the Alfriston roundabout and take the Upper Dicker exit.

To attend, please complete the reply slip at the end of the newsletter, which has a closing date of May 5th. The cost will be £5.50 per person.

Visit:
Wednesday 14 June 2006*, 6-30pm, Harvey's Brewery, Cliffe High Street, Lewes, East Sussex.

An evening tour of a famous, old established Sussex Brewery, founded in 1790. The tour will take approx. 90 minutes and will be followed by an informal sampling of the products. Tour parties are limited to 25 persons and the cost is £2-50 per person, redeemable at any John Harvey Tavern.

***Directions:* -** Travelling east on the A27, take the Lewes by-pass and at its eastern end roundabout, take the first exit and travel through the Cuilfail Tunnel. At the end of the tunnel roundabout, take the first exit and travel approx. 200 yards to the mini roundabout (Tesco filling station diagonally opposite). Take the first exit and follow the road round to the public car park. Time your arrival to just after 6-00pm when car parking is free. With Cuilfail Hill behind you, proceed to the western end of the car park, turn left along the pedestrian passageway and out to Cliffe High Street. Turn right and Harvey's Brewery Shop is approx.5 minutes walk on the right hand corner. Turn right beyond the shop into the Brewery precincts where we will be met.
Allow some time for the traffic in the Cuilfail Tunnel area as our visit is towards the end of rush hour.

****At the time of this Newsletter, the above date still needs to be confirmed. The final date will be notified to all successful applicants. Harvey's are aware of our preferred date and will try to oblige, but please be prepared for an amended date. Should this occur, any member who cannot attend will be reimbursed.***

Please complete the Reply Slip at the end of this Newsletter. Successful applicants will be informed.

Outing:
Wednesday, 5 July 2006, (for times see below), Portsmouth Harbour Attractions.

Historic Portsmouth Harbour has many excellent attractions, and our Outing offers members an opportunity to see their choice of all of the attractions throughout the day.

The full list is, Harbour Tour by boat, Action Stations, Mary Rose Ship Hall, Mary Rose Museum, Royal Naval Museum, HMS Victory, HMS Warrior, and the Spinnaker Tower.

For the pre-arranged parts of our visit: -

- A guided tour of HMS Warrior has been arranged for 1-30pm and
- A visit to the top of the Spinnaker Tower for 3-00pm.

It is requested that all taking part in this outing join these two events.

The tickets we will have will be valid for the whole day, thus allowing other attractions to be visited by Members and Guests at no extra cost. These extra visits can be at any taken at your leisure at any time to suit you during the day, prior to or after the pre-arranged attractions.

Further general information is available at
www.historicdockyard.co.uk and www.spinnakertower.co.uk

The cost of the Outing will be £12-60* per person, and the party will be limited to 20 persons. There are many facilities for meals and refreshments in and around the Harbour Sites. Car parking at the Harbour is currently limited due to improvement work. If on arrival, the car park is full, please follow the directions to the alternative parking; it is still within a 5 minute walk of the Harbour Attractions. Rail travel is very convenient, with the South Coast line to Portsmouth Harbour Station, which is only few minutes walk from the Harbour entrance and the Spinnaker tower.

*This cost includes the use of the internal lift at Spinnaker Tower. For those wishing to use the panoramic lift, there is a premium of £2-00 per person. payable at the time.

To attend, please complete the Reply Slip at the end of this Newsletter. Tickets for the day will be sent in advance to all successful applicants

REPORTS

Stan Renew – Presentation **(Unfortunately this item was omitted from the last Newsletter)**

At the RCEA AGM in September 2005, our President Brian Buckroyd made a small presentation to Stan to thank him for his work on behalf of the RCEA since 1992. His contributions over the years have been invaluable to the success of the organisation. Stan was RCEA Hon. Secretary 1992/93, Vice President 1993/94; President in 1994/95; Committee Member 1995/96; Hon Membership Secretary 1998/2001; and Committee Member again from 2001 – 2005.

Talk:
Tuesday 10th January, Safety in Process Engineering by John Pound, (Member)

The President, in his introduction, noted the speaker's long experience of safety issues in process plants in many parts of the world. In his opening remarks, John paid tribute to Trevor Kletz, a pioneer in this field, much of this contained in his book, Lessons from Disaster. The talk proceeded to illustrate industrial disasters, of varying seriousness, over recent decades, and lessons learnt.

The first example was of Flixborough, North Lincolnshire, where in 1974 a cyclohexane oxidation plant was destroyed, with the deaths of 28 people. From this resulted the creation of the Health and Safety Executive.

The next scene noted was in northeast UK, the North Tees area, at an oil refinery, where a footbridge was being installed at a naphtha tank farm. Welding took place and the operatives were unaware of a nearby leakage of flammable naphtha. An explosive flash occurred, killing two. At the same refinery, during the routine examination of a hot oil pump, following initial checks, action was taken to dissemble the pump, without prior permission. Hot oil exploded, killing 3 staff.

Working with Celanese Canada Inc. in Alberta provided more valuable experience. As part of natural gas supply, a large horizontal autoclave was used to clean and recycle acetone. The autoclave opening was at a domed end, held in place by bolts. On one occasion the bolts were loosened whilst the vessel was under pressure. This blew off the bolts remaining and the domed end, with serious consequences. The bolts were changed to a specification that permitted safe opening. At a Celanese methanol plant of long standing, carelessness in line connection caused the reverse flow of caustic soda. Clamps were loosened with hoses under pressure, causing leakage. This resulted in all hoses being identified. Pressure Inspection Diagrams were displayed to show pressure levels at all points in the plant.

Resulting from a serious incident in Texas, where 16 people were killed, major safety improvements were actioned. Resulting from Federal Edict 1010, a Management change Form was introduced as part of Quality Assurance. Process Safety Reviews were carried out and the Safety Form signed off and audited. The need for clear communication was emphasised, with one Engineer responsible for safety procedures.

A lively question and answer session followed, with the recent major fire at Buncefield Fuel Terminal, Herts. fresh in the minds of the audience. This was followed by a well-deserved vote of thanks for a most interesting and topical talk.

C Harrison

Visit.
Wednesday 8th February, Ceres Power, Crawley.

Following the highly successful visit last year, which was substantially oversubscribed, the repeat party comprised 11 members and1 visitor from I Mech E.

We were welcomed by Bruce Girvan (CEng) Technical Marketing Manager and Matthew Harrington (AIMechE), one of the Development Engineers, who gave an excellent and comprehensive presentation on fuel cells and the development of Ceres Power. On this occasion, due to customer testing, we were unable to visit the test, development and assemblies but still gained a fascinating insight into the principles of fuel cells and their major potential in meeting future energy needs. This was particularly topical against the rapidly changing energy scene both in the UK and worldwide regarding future supply and demand. In addition global warming and the need for improved efficiency in energy use created exciting and challenging opportunities for Ceres Power in bringing their fuel cell products to market.

In the four years since the company was created, it has built on its world-class technology to become a commercially focussed organisation with a very strong intellectual property portfolio. Past year successes have included generating commercial revenues, doubling facilities and staff plus endorsements from the City, government and industrial partners.
Recent accolades have included winning the prestigious Institute of Materials, Minerals and Mining Gold Medal and the Carbon Trust Low Carbon Technology of the Year Award. The company has established specific relationships with defined market applications. Associations have been created with major corporations with direct access to end-users of energy, including British Gas for micro-CHP and BOC for off-grid power generation applications.

Fuel cells offer a better way of producing electricity and heat in a highly efficient, quiet and non polluting way, providing opportunities for more secure, sustainable energy supplies worldwide using a variety of fuel types. In the early stages of development, fuel choices were limited to complex systems operating at very high temperatures or vulnerable low temperature systems only able to run on pure hydrogen.

Ceres Power has developed the world's first commercial metal supported solid oxide fuel cell (SOFC) operating at an intermediate temperature of around 500 C and capable of using a range of fuels including LPG, natural gas, methanol, hydrogen and vehicle fuels. These traits provide significant advantages for mass market uses.

In the SOFC oxygen ions from air react with hydrogen or hydrocarbon gases under controlled conditions at high temperatures to produce electricity and heat without combustion. Electrical power from a single cell is typically 3 to 5 watts at 0.7 volts: to obtain useful output levels, fuel cells are assembled into stacks and then into systems. Total system efficiency (LHV fuel in to net AC heat and heat out) is high around 85% compared with 25-45% for conventionally generated electricity.

Solid Oxide Fuel Cell (SOFC) designs basically comprise a ceramic electrolyte, with oxide cathodes and ceramic -oxide anodes. Ceres achieved a major breakthrough by identifying a method of depositing an oxide electrode on to a stainless steel support. Endurance testing has successfully demonstrated cell reliabilities and levels of 30-40,000 hours are confidently expected.

Ceres Power has identified a number of target applications

Combined heat & power-gas boiler replacement-domestic and business premises
Off-grid power supply- telecoms, farming, residential buildings
Auxiliary power units-secondary power for vehicles, containers & military applications
Uninterruptible power supplies-hospitals, military, computers, banks, domestic and business premises

The Future - Pilot programme aimed at domestic premises commences in 2007-08

Ceres Power was formed in 2001 to exploit the revolutionary fuel cell technology developed by Imperial College. It produces on site, fuel cell components for assembly into fuel cells by its customers. Ceres Power won the Carbon Trust 2003 Innovation Award for the small business category. For more detail visit www.cerespower.com

R Budden

Talk:
Tuesday 14th February, Microwaves Everywhere by Peter Gibson, (Member)

The so-called 'Peace Dividend' from the once secret military uses of microwave energy was amply illustrated in the first third of this talk by way of a PowerPoint slide show (courtesy of Ken Wheller). They range from the esoteric command, control, and

communications at 3,000 million miles for the New Horizons space probe to Pluto to the mundane mobile phone in your pocket, and from the domestic microwave oven to traffic light control at country road works; taking in EGN (electronic news gathering) and medical LINACS (linear accelerators) along the way.

The second third of the talk was taken up with the properties of microwave radiation. Holding up a pocket radio in the left hand and a torch in the right he explained that microwaves and the infrared shared the territory in between. Current everyday uses for microwaves (TV, satnav, rfid tags, etc.) are all crammed into the 1,000 to 12,000 MHz atmospheric window which also, alas, includes the astronomers' 21cm neutral hydrogen line which he illustrated as an aside with slides of the constellation Cassiopeia in both the visible and the microwave spectrum.

The third part of the talk dealt with the engineering breakthroughs that led to the release of these radiations, for good or ill, on domestic populations all over the world. Holding up his (still painted yellow) spanner the speaker recalled that microwave engineers are called plumbers in the USA because of their propensity for erecting long runs of 'waveguide' from masthead to radar cabin, down mast and through cabin walls without so much as a 'say so'. The breakthroughs came with the almost simultaneous development of digital radio, the discovery of the Gunn diode effect, thin film printed circuit technology, very inexpensive and reliable methods of producing substrates, and beam-lead diode technologies. The use of a doughnut and pencil was left to the end of the talk.

Peter Gibson

Visit
Manhattan Kitchens, Lancing on Wednesday 22nd February 2006

18 Members and 8 guests visited Manhattan Kitchens factory, which occupies one of the main assembly shops of the erstwhile Southern Railway Carriage and Wagon Works at Lancing.

On arrival, Iain Flitcroft, the MD, gave an introductory talk tracing the history of the company from two ex-RAF wartime friends making wooden clock cases from scrap, new timber being scarce in 1945, to the present day concern which makes and installs some 8000 kitchens per annum. Their customers are almost exclusively builders and developers.

Following this talk, John Hinde, the Engineering Director, talked us through the fully computerised continuous flow procedure from initial enquiry to signing off the installation. It was very impressive to someone like your reporter who never went near a computer during his whole working life!

Subsequently, we split into two groups and toured the factory. We saw impressive woodworking machinery, all computer controlled, each attended by one person. They do, however, have a bespoke workshop where "top end" items are made by hand. Incidentally, doors, except for specials, are outsourced from the Far East.

In the manufacturing process, perhaps the most interesting point was the attitude to waste, where a calculation is made comparing the cost of the wasted material with the time required to use the material to the limit. Usually, it is cheaper to waste material.

The visit concluded in the impressive Showroom where a selection of kitchen finishes in all three-price ranges is displayed. This is to some extent a retail outlet operated by a separate franchised company who measure and fit kitchens in the retail sector but only use Manhattan items. Members are offered a 30% discount if RCEA is mentioned when ordering.

Judging by member's comments, the visit was seen as both interesting and worthwhile.

R Norton

Spring Lunch,
Friday 24th February, Training Restaurant. Northbrook College.

.

Forty members and guests met at Northbrook this year for the Annual Spring Lunch. The College as a deliberate policy to improve the experience for lunch goers and to give them more time to supervise the students had restricted the number. This event would have easily been oversubscribed.

Talk:
Tuesday 14th March, The Sentinel Steam Lorry by Jim Hatfield,

In his talk Jim gave us a very interesting broad outline of the development of Steam Lorries from 1896 when the first Road Lorry Act was passed right through to the present day preservation scene.

He showed the types of boilers used, including a flash steam unit, plus the various designs of engines and transmissions used by the various makes with numerous drawings and pictures to illustrate his points.

Amongst the interesting facts quoted were the standard 6o HP 230 psi unit could achieve 20 mph whereas the 80 HP super at 275 psi could achieve 30 mph all on an 8 inch stroke and 6 inch bore engine. Whereas solid tyres would give 20 mph while on pneumatics 45 mph could be achieved.

Jim then divulged his own love for his personal lorry, which is a Sentinel DG type which started life as the first ready mix concrete lorry, complete with picture to prove it. Although it is now converted to a normal open lorry behind the cab in case you should wish to have a side. This lorry uses about 7 gallons of water per mile and does about 15 miles per hundredweight of coal so not exorbitant on fuel costs. He runs on solid tyres with a showerhead over each, dripping water to keep them cool, thus ensuring no puncture problems.

Jim concluded his talk with an extremely interesting batch of slides showing his own and other preserved lorries around in the present preservation scene and gave us many amusing stories about his activities with his lorry.

His enthusiasm for his subject came over loud and clear and judging by comments I heard afterwards, kept the whole of his audience thoroughly enthralled throughout the afternoon.

Ray Parsons

REPLY SLIP 1:

To Colin Harrison, 41 Cluny Street, Southover, Lewes, East Sussex, BN7 1LN Tel.01273 487026.

I/We wish to join the visit to
Harvey's Brewery, Lewes, on Wed.14 June 2006*, at 6-30pm. *Unless amended.

Full name……(Block capitals)
Address……
……
……
Phone number…… **Number of persons**……

Applications please by **30th April 2006**.
I enclose a cheque, payable to RCEA for **£……(£2-50 per person)**

REPLY SLIP 2:

To: Colin Pilling, 84 Marine Crescent, Goring–by–Sea, BN12 4JH
Tel 01903 522356

I/we wish to join the outing to
Michelham Priory and Gardens, 2 pm. Tuesday 16th May 2006.

Full Name…….(block capitals)
Address…….
…….
…….

Phone No……. Number of Persons……..

Applications please by 5th May 2006.

I enclose a cheque made payable to RCEA for **£……(£5.50 per person)**

INTENTIONALLY BLANK

REPLY SLIP 3:

To Colin Harrison, 41 Cluny Street, Southover, Lewes, East Sussex BN7 1LN tel. 01273 487026

I/We wish to join the outing to
Portsmouth Harbour on Wednesday 5 July 2006, including the guided tour of HMS Warrior (1-30pm) and the Spinnaker Tower visit (3-00pm).

Full name:……(Block capitals)
Address………
……
……
Phone No…… **Number of Persons**……..

Applications please by 31st May 2006.

I enclose a cheque made payable to RCEA for **£……..…(£12-60 per person)**

Successful applicants will receive tickets in advance.