Time	Monday 22 Oct	Time	Tuesday 23 Oct	Time	Wednesday 24 Oct
	Basics of High Voltage Power Systems and Components	Time	Individual High Voltage System Components and Testing Techniques	Time	Basic Aspects of High Voltage Testing and Test Techniques
08:30	Registration				
09:00	Chairman's welcome and course synopsis Prof. Noel Shammas, Professor of Microelectronics and Solid-State Electronics, Staffordshire University, UK	09:30	High Voltage Switchgear  Technologies  Design issues  Manufacture  Insulation Systems  Testing  Application  Future  Dr Derek Pinches, Research and Technology, Alstom Grid	09:00	Other testing techniques - Lifetime Substation Consideration  Life Time Issues including PAS 55  Internal arc requirements for switchgear  Environmental considerations  Maintenance Testing Considerations  Failure Reporting  Ian Naylor, Principal Consultant, EA Technology, UK
09:15	High Voltage Engineering – Setting the Scene:  Systems Components Development and trend Dr Mark Osborne, National Grid, UK	10:30	Monitoring High Voltage Equipment and Systems  Concepts of Monitoring  Example of Generic Approach – Chromaticity  Illustrative examples of use  Transformer oil monitoring  Transformer Tap Changers  Partial Discharges Identification  Combination of Complex data  Future perspective  Professor Gordon R Jones, Emeritus Professor, University of Liverpool, UK	10:00	Testing for endurance and reliability: HV renewable power systems Role of testing (examples of submarine cables and generator HV insulation systems)  Development  Type Routine/FAT Commissioning/SAT Diagnostic Developing standardisation (examples of large offshore wind turbines, their rotor blade lightning strike testing and mechanical drive train testing)  Need for standards Development of standards Evolution of standards Evolution of standards Alex Neumann, Director of Specialist Services, Narec
10:15	Refreshments	11:30	Refreshments	11:00	Refreshments
10:45	High voltage system stresses and insulation coordination  Basics of high voltage discharges  Sources of overvoltages on the power systems  Balancing reliability, size and cost  Prof. Ian Cotton, University of Manchester, UK  Power Electronics – Technologies & Applications	12:00	Power Transformers and HV bushings Jim Yare  A Basic Aspect of HV Engineering – Electrical	11:30	High Voltage Testing Techniques  Power Frequency  AC  Impulse  DC  PD  HansErik Keizer, Planner, KEMA, The Netherlands  Visions of the Future / Emerging Technologies
	<ul> <li>HVDC</li> <li>FACTS</li> <li>PE applications in distribution networks (custom power technology)</li> <li>PE for the smart grids</li> <li>Dr G A Putrus, University of Northumbria, UK</li> </ul>		Breakdown and Ionisation Phenomena Jack Blackett, Consultant, UK		Smart Grid     Energy Storage     HVDC Grid     Wind Farm Connections     Integrated Offshore Network     Offshore Platforms     Gearóid O'Heidhin, Alstom Grid, UK
12:45	Lunch	14:00	Lunch	13:30	Lunch
13:45	High Voltage Overhead Power Lines AC and DC  Technologies Design issues Manufacture Testing Application Future Jon Knapper, Allied Insulators Group Ltd, UK	15:00	Basic Measuring and Testing Techniques – The Science of HV testing Jack Blackett, Consultant, UK	14:30	Afternoon of Technical Visit to Alstom Grid
14:45	Refreshments	16:00	Refreshments		
15:15	High Voltage Systems Components: High Voltage Cables: Implications for Transmission and Distribution of Electric Power, DC and AC systems,, Underground and Sub Sea Cables A Barclay, Principal Engineer, Kinectrics International Europe, UK	16:30	Chairman's day review, connecting basic aspects to real conditions & Q&A Prof. Noel Shammas, Professor of Microelectronics and Solid-State Electronics, Staffordshire University, UK	17:00	Chairman's course review, delegates discussion , distribution of certificates of attendance and Close Prof. Noel Shammas, Professor of Microelectronics and Solid-State Electronics, Staffordshire University, UK
16:15	Chairman's day review, relevance to testing & Q&A Prof. Noel Shammas, Professor of Microelectronics and Solid-State Electronics, Staffordshire University, UK	17:00	Close of Day		
16:30	Close of Day				