



23<sup>rd</sup> International Conference on

### STRUCTURAL MECHANICS in REACTOR TECHNOLOGY

### SMIRT 23

### Manchester, United Kingdom

August 10 to 14 2015



# Overview



- •Organisation •ISC
- •Programme
- Social programme
- •Seminars
- •Website Issues

- Papers
- Delegates
- Budget
- Sponsors
- Financial Support
- Questions



## **Local Organisation**





**Dave Shepherd** Chairman, SMiRT 23 Nuclear Safety Consultant **Retired Superintending** Officer, ONR



Dr Manus O'Donnell Chairman of the ISC **Research & Development** Head of Function, EDF Energy Generation



Professor Nawal Prinja Deputy Chairman, ISC **Technical Director** AMEC Foster Wheeler, Clean Energy



Dr Christopher Race **Dalton Research Fellow** School of Materials University of Manchester



Principal Inspector Office for Nuclear Regulation

Peter Ford



Tim Morris Sponsorship Organiser Chief Executive NAFEMS







**Rachael Macartney** SMiRT 23 Conference Team **Communications Officer** EDF Energy Generation



Matthew Dawber SMIRT Conference Team Technical Secretary, ISC AMEC Foster Wheeler, Clean Energy



Harris White

#### Sonia Shepherd

SMiRT 23 Conference Team Social Program me Co-ordinator



Christine Waata

SMIRT 23 Conference Team Technical Admin Team **EDF Energy Generation** 



SMIRT Conference Team Technical Admin Team EDF Energy Generation



### **International Scientific Committee**



	Division I	Division VI				
Dr Andrey Jivkov	University of Manchester, UK	Dr Paul Smith	AMEC FOSTER WHEELER, UK			
Prof Daman Panesar	University of Toronto, Canada	Dr Ayman Saudy	Candu Energy, Canada			
Jingsong GUO	EDF Energy, UK	Dr Sanj Malushte	Bechtel, USA			
	Division II	Divi	ision VII			
Prof Steve Garwood	Imperial College, UK	Dr John Llambias	Ristec, UK			
Elisabeth Keim	AREVA, Germany	Dr Seichiro Fukushima	TEPSCO, Japan			
ProfYun Jae Kim	Seoul University, Korea	Dr Masoud Zedah	Bechtel, USA			
Dr Eric Mathet	ATMEA, France	Dr Ravi Ravindra	MKRavindra Consulting, USA			
ſ	)ivision III	Division VIII				
Dr Van-Xuan Tran	EDF Energy	Dr Russ Booler	ONR, UK			
Dr Cheryl O'Brien	Idaho National Labs, USA	Dr Steven Doctor	Pacific Northwest Laboratories, USA			
Keith Wright	Rolls Royce	Div	ision IX			
C	ivision IV	Professor Anthony Bamford	National Nuclear Laboratory, UK			
Peter Ford	ONR, UK	Dr Bhasker Tripathi	NRC, USA			
Annie Kammerer	Bechtel, USA	Dr Stephen McDuffie	US DoE			
Emmanuel Vallet	EDF, France	Division X				
Shin Morita	Japanese Nuclear Regulation Authority, Japan	Professsor Tim Abram	University of Manchester, UK			
Γ	Division V	Dr Libin SUN	Tsinghua University, China			
Prof Colin Taylor	University of Bristol, UK		1			
Malcolm Goodwin	ABS Consulting, UK	-				
Susumu Nakamura	Institute of Applied Energy, Japan	_				



### Early Career Award and NED

- SMiRT 23 Early Career Award (previously know as the junior award)
  - A) Candidates must opt in to be considered for this award which will be made to the presenter of the paper judged of most merit in recognition of their contribution to the Structural Mechanics in Reactor Technology Conference.
  - B) The award will be presented at the SMiRT 23 closing ceremony.
  - C) They will be invited to provide an extended paper in the special edition of the NED
  - D) The winner will receive a cash prize worth \$1000 + registration fee for SMiRT 24.
- NED Special Edition
  - Organisation in place to deliver under supervision of Andrey Jivkov at University of Manchetser
  - Initial contact with NED editor but subsequently no responses
  - Diverse approaches under consideration



# Programme



IASMIRT

	Manday Tessiay			Weinesiay			Thursday			Riday										
Room	9.00 to 30-30	1100m 12:45	Mill to 15:45	16 15 to 18 00	900to 10:30	11:00 to 12:45	Mill to 15:45	lii Išto IBill	900to 10 30	1100to 1245	Mill to 1545	16:15 to 18:00	900to 1030	1100m 1245	1400m 1545	1615 to 1800	9 00 to 10 30	1110to 1245	1245tn1300	16:00 to 18:00
Lyric	Opening Session Dave Shepherd, Bob Ainsworth	Plenary Session David Boath, Stuart Crooks, Andy Hall	Plenary Session Sujt Smaddar, Dame Sue Ion, Manus O'Donnell, Dave Shepherd	Division V Scianic Re- evaluation	Plenary SMRs	Division VI International Research and Codification Activities for Steel- Plate Concrete (SC) Structures	Division IX Decommisioning - Qurrent situation of Fukushima; current research activities.	Required by Lowry	Plenary Flooding Post Fukushima	Division VII Risk-informed Regulatory Framework for External hazards	NUGENIA + Integration of National R&D Program mes Workshop	IASMIRT General Assembly	Plenary - John Stevenson, and New Build and Harmonisation of Codes	Division V Linear and Nonlinear SSI Analysis: How, When, and Where?	Division V SQUG Panel Session	Division V Honoring and Remembering John Stevenson	Division V Time Domain Non- linear Seismic Soil- Structure Interaction	Plenary - Future Perspectives in NPP material ageing	Closing Ceremony and Early Career Award	
0.mp.ns.				Division V Airbane Missiles Astessment	Division V Seisanic - Advanced SSI Techniques	Division VII State-of-the-art session on component fragility of NPP	Nuclear Applications of Graphite Workshop 1	Nuclear Applications of Graphite Workshop 2	Division V Seismie - SSI Response and Methodology	High Temperature Assessment Workshop 1	High Temperature Assessment Workshop 2		Division V Seisanic Response of Pile d Foundations	Division IX Concrete degradation mechanisms	Division II Fatigue Ascessment of Components	Division II Fracture Assessment Methodologies	Division II Bevated Temperature, Greep and Fatigue			
Quoys				Division II Gracking in AGR Graphite	Division II Microstructural Considerations of Graphite	Division V Se isanic Qualification	Division V Developments in Seismic Isolation	Division V Piping and Distribute d Systems	Division VI Fragility and Experience Data	Division V Seisanic Response of Anchors	Division VII Design Extension Conditions		Division II European Codes and Tools in Fracture Mechanics	Division V Seismic Response of Components	Division II 1894 Integrity Considerations	Division V Gancrete Impact Capacity Analysis	Division VII Probabalistic Safety Analysis - Plant Applications			
Studio 1				Division V Seisanic Response Testing	Division II Application of Experimental Testing		Division I Fatigue and Fracture in Steels	Division V Effect of Concrete Parameterson Import Capacity	Division V Seisanic Response Analysis of Structures	Division V Site Response	Division I HDPE		Division I RPV Embrittle ment	Division III Engineering Analysis and Sim ulation Competency in the Nuclear Sector	UK Forum for Engineering Structural Integrity (FESI) Workshop	Division I Testing for Material Properties	Division II Witration and Dynamic Analysis			
Studio 3				Division I Structural Performance of Malti- Metal Project	Division III Innovative Simulation of Components	Division II Application of Finite Bement Techniques	Division VII Risk Assessment Applications	Division V Seisanic Isolation Evaluation Method	Division II Ducble Fracture Assessment and Practical Applications	Division V Modelling Considerations in Response of Structures	Division V Fluid- Structure Interaction Reactor Components		Division III Simulation of Severe Accident Interactions	Division V Impact and Damage Evaluation	Division V Impactin Fuel Storage Facilities	Division V Fluid-Structure Interaction	Division V Modelling Considerations in Response of Comparents			
Heagon				Division V Base Isolation Design Isoues	Division V Base Isolation Response Issue s	Division V Response of Buried Structures	Division VII Ageing Marcigement of Concrete Structures	Division V Seisonic Margins and Shear Walls	Division VI Seixmic Margins - Core Studies	Division II Application of Fluid Dynamics	Division II J Brakation Schemes		Division VII Plant Resilience Initiatives	Division II Fatigue: Crack Growth	Division V Seismic - SSI Response and Correiderations	Division V Seisanic Response and Ground Motion Effects	Division II Soil Structure Interaction and Nor- line ar Conside rations			
Denis 1				Division I Constraint Effects and Residual Stresses	Division II Residual Stresses and Defect Interaction	Division V Concrete Impact Capacity Testing	Division VI Component Design Issues		Division VI Containment	Division VI Saliety Considerations of Reinforced Concrete Structures	Division W De sign for Hazardous Loading Stuations		Division I Welding and Embrittlement	Division I Concrete - Degradation Mechanisms	Division VII Risk Informed Decisions	Division VI Steel Concrete Companite Structures	Division VI Steel Concrete Structures - Design			
Studio 2				Division VII Enternal Hazards		Division I Concrete - Marine Erwir ornwents and Chloride Attack	Division VII Seisanic Margires - Methools	Division VI Application of Steel Concrete Composites to BWRs	Division I Concrete - Temperature Effects	Division 18 SMART 2003	Division III Effect of Embedment on SSI Response		Division VI Vibration and Impact bootstion	Division X Considerations of Liquid Metal Reactor Design	Division W Earthquake Hazard and Site Response	Division VI Probabalistic Safety Analysis - Methods and Uncertainties	Division VII Determination of Fragility by Analysis			
Terrate				Division VII Mitigation Approaches for Extending NPP Component Service 135-	Division VII Ageing Management	Division IV Seionic Hazard Methods and Applications	Division VII Non-scisario Fragilities	Division VII Severe Accidents		Division II Graphite Fracture	Division VI Fragility of Aircraft Impact Hazard		Division VII Fragility of Structures	Division VII Probabalistic Safety Analysis - Analysis Factors	Division VII Effect of Base- isolation on Fragilities	Division VII Monitoring and NDE/ISI of Concrete				
South Room				Division IV Flood Hazard and Local Pertubation Effects	Division V Aircraft Impact	Division II Fatigue Conside rations for Long-term Operation	Division VII Optimisation Strategies for NPP Maintenance Planning	Division VI Development of Fragility Techniques	Division VII Fragility of Mechanical Components	Division X Design Features and Studies	Division X Reactor Design Evaluation and Regulation		Division VII Reguirements, Regulations, and Methodology	Division VII In-service Examption and Human Factors	Division I Concrete - Alla li Aggregate Reaction					
Deck 2				Division III Aircaft Impact	Division II Modelling of Fael Assembly	Division II Analysis and Modelling of Mechanical Components	Civision II Modelling and Simulation Applications	Division II Modelling of Reactor Cores	Division VII Inservice Impection and Monitoring	Division D( Fuel Packaging and Storage	Division IX De com missioning Hazands		Division X Design Considerations of Steel Structural Concrete	Division VI Fastenings and Anchorages		Division II Leak-Before-Break				



# **Summary of Focused Sessions**



IASMIRT

	Tues	sday		Wednesday				Thursday				Friday		
9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:15 to 18:00	9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:15 to 18:00	9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:15 to 18:00	9:00 to 10:30	11:00 to 12:45	
Plenary SMRs	Division VI SC modules and new civil structure codes	Division IX Decommisio ning - Current situation of Fukushima; current research activities.		Plenary Flooding Post- Fukushima	Division VII Risk- informed Regulatory Framework for External hazards	NUGENIA + Integration of National R&D Programmes Workshop	IASMiRT General Assembly	Plenary - John Stevenson, and New Build and Harmonisati on of Codes	Division V Linear and Nonlinear SSI Analysis: How, When, and Where?	Division V SQUG Panel Session	Division V Honoring and Rememberin g John Stevenson	Division V Time Domain Non-linear Seismic Soil- Structure Interaction	Plenary - Future Perspectives in NPP material ageing	
	Division VII State-of-the- art session on component fragility of NPP	of Graphite	Nuclear Applications of Graphite Workshop 2			High Temperature Assessment Workshop 2			Division IX Concrete degradation mechanisms					
		Division V Developmen ts in Seismic Isolation				Division VII Design Extension Conditions								
						Division I HDPE			Division III Engineering Analysis and Simulation Competency in the Nuclear Sector	UK Forum for Engineering Structural Integrity (FESI) Workshop				



## **Social Programme**



### SMiRT 23 | Manchester 2015 | Social Programmes

### Website Link

### Monday 10th August

#### Walking Tour of Manchester

Our tour will combine the old and the new with opportunities to see hidden gems and our favourite secrets.



### Wednesday 12th August

### **Chester Day Trip**

Chester is the spiritual home of real shopping: it has the oldest shop front in England and the inimitable Rows -700 year-old two tier covered shopping galleries giving you 2 high streets in one.



### Thursday 13th August

### Pride & Prejudice at Lyme Park

You will have the opportunity to be Lord & Lady of The Manor and to visit one of England's' most stunning house & gardens and extensive estates – A taste of real England!



### Tuesday 11th August

### **Liverpool & The Beatles Experience**

Enjoy a fun and fascinating 2 hour tour of Beatles Liverpool. You'll be kept entertained along the way by one a professional Beatles Guides and some Fab Four tunes.



### Wednesday 12th August

#### Chester Zoo

There are over 400 different species at Chester zoo, including some of the most exotic and endangered animals in the world. So there's plenty to explore on your visit.



### Evening Tours



A range of different tours, focusing on Manchester's scientific & nuclear heritage; past & present. All including meals, drinks & refreshments.

Click on individual tours above for more info & to buy tickets





### TECHNICAL TOUR Technical Tour of Heysham 2 Nuclear Power Station Tuesday 11th August 2015



Our platinum sponsor, EDF Energy Generation has kindly offered to host the key SMiRT 23 Technical Tour at Heysham 2 Nuclear Power station.

This fascinating tour will take the visitors on a tour of the pilecap, control room and turbine areas, as the plant staff explain the technical features of a graphite moderated power reactor. All delegates will be transported by coach from the Lowry Arts Centre and will be welcomed with a buffet lunch on arrival at the recently opened Heysham 2 Visitor Centre.

Start Time: 10:00 Coach departs from the Lowry Arts Centre

End Time: 17:45 (approx) attendees return to the Lowry Arts Centre

Ticket Price Per Person: £22 per person





### **Post-SMiRT 23 Seminar**



### FIRST ANNOUNCEMENT AND CALL FOR PAPERS

14<sup>th</sup> International Seminar on

### FIRE SAFETY IN NUCLEAR POWER PLANTS AND INSTALLATIONS

(SMiRT-23 Post-Conference-Seminar)



Deadline for abstracts May 15, 2015

August 17 – 18, 2015 The Old Fire Station, , University of Salford, Salford M5 4WT, United Kingdom

#### 14th International Seminar on

FIRE SAFETY IN NUCLEAR POWER PLANTS AND INSTALLATIONS

### ORGANIZERS

#### **Anastasios** Alexiou

Office for Nuclear Regulation Desk 6, 4S.2 - Redgrave Court Merton Road, Bootle L20 7HS UNITED KINGDOM + 44 (0)151 951 4330 Anastasios Alexiou@onr.gsi.gov.uk

#### Dr. Marina Röwekamp

Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH Schwertnergasse 1 D-50667 Köln GERMANY +49 (0)221-2068-10898 (fax) marina\_roewekamp@grs.de

#### **Geraint Williams**

Office for Nuclear Regulation Desk 6, 4S.2 - Redgrave Court Merton Road, Bootle L20 7HS UNITED KINGDOM + 44 (0)151 951 5734 Geraint.Williams@onr.gsi.gov.uk

#### Dir.& Prof. Dr. Heinz-Peter Berg

Bundesamt für Strahlenschutz (BfS), SK Willy-Brandt-Str. 5 D-38556 Salzgitter GERMANY +49 (0)18-333-1535 (fax) hberg@bfs.de



### **Post-SMiRT 23 Seminar**



Post-SM iRT 23Seminar www.postsmirtistanbul.org



#### Post-SM IRT Seminar on NEW BUILD NUCLEAR POWER PLANT DESIGN and SAFETY CONSIDERATIONS

#### CALL FOR ABSTRACTS

Thepurpose of thisseminar is to provide an international forum for detailed technical discussion of topics relevant to the analysis and design of new build nuclear power plants. In particular, technical sizes relevant to the analysis and design for the unit of the discussed. These will include the required infrastructure, site related issues and design features that needs to be reviewed to or aluate the feasibility of the project. The seminar will also address concerns resulting from the Flukushima accident on site evaluation and design of new projects. Over 3 days, these minar will address the following areas:

- Required Infrætructure
- Post Fukushima Evaluation and Design for External Hazards
- Seismic Basel solation Technology and Applicability to New build projects
- Development and Integration of Quality Assurance and Safety Culture

Theparticipants include major industry representatives from Turkey, Japan, China, US and European countries, Theseminar represents an excellent opportunity to exchange experience and knowledge on the latest developments and to maintain contact with all the players in the nuclear industry.

T beseminar (www.postsmirtistanbul.org) is to be held at the Hilton ParkSA Hictel in İstanbul, Türkiye, from 21 to 23 October 2015.

Weinwiteauthorstosubmit abstractsfor oral presentation at the Post-Smirt23Seminar in Istanbul, We look forward to sepour benign presence with active contribution and support torm ake this event successful.

I important dates Opening of Abstract submission: July 28<sup>th</sup>, 2015 Deadline for Abstract submission: August 10<sup>th</sup>, 2015

Sincerely Yours,

D r. Aybars Gürpinar, Chairman

Post-SM iRT 23Seminar Secretariat:

Dr. Yakın Bulut, Turgut Özal University Email: youlut@turgutozal.edu.tr Dr. Ömer O. Erbay, MATRiSeb Email: coerbay@matriseb.com



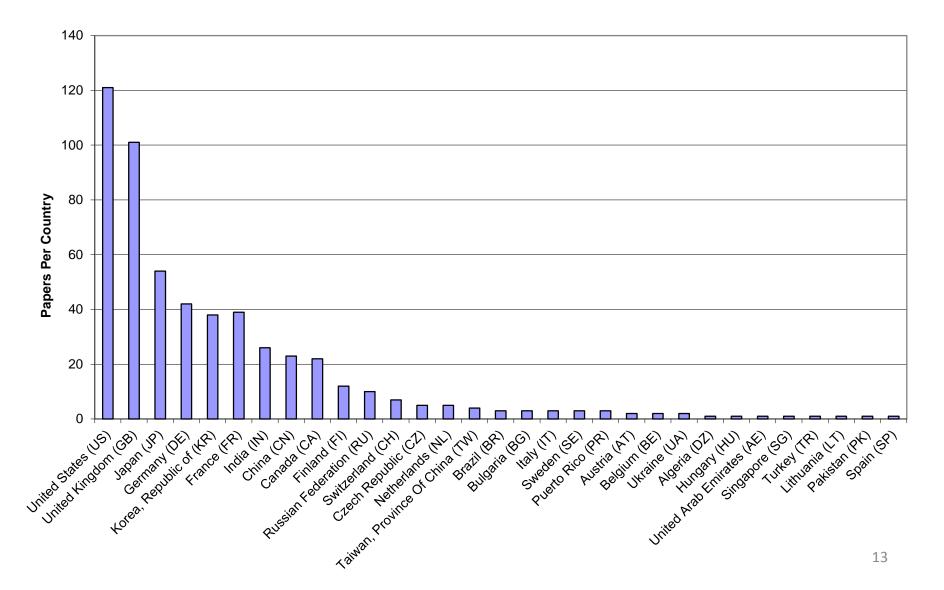


- Webtool difficulties never resolved all issues
- January 2015 hacking problems
- Alternative Website established February 2015
- Not all features of Webtool replicated
- Ownership of solution important cannot resolve complex issues across three continents



## **Papers by Country**

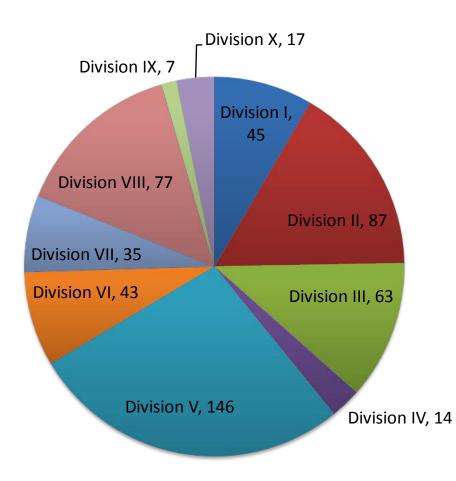






# **Papers by Division**

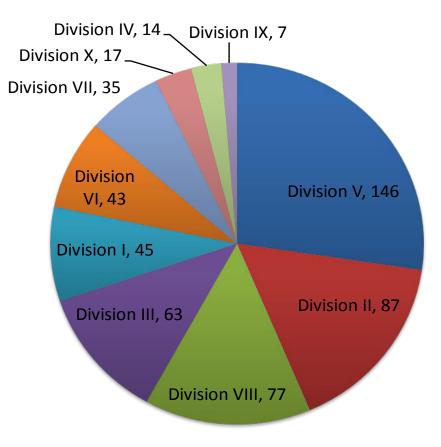






# **Papers by Division**

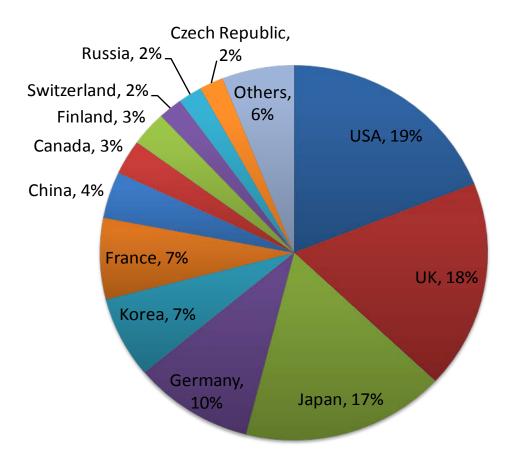






# **Delegates by Country**







# **Summary of Paid Delegates**



<b>Registration Fee</b>	Budget	Forecast
£795	295	99
£496	250	386
£175	50	55
Totals	595	540
Total Income	£ 346,500	£ 272,470



Income



	£ Budget	£ Forecast	£ Variation
Full Fee Delegates	214.50	71.78	-142.73
Early Bird/Academic	125.00	191.07	66.07
Student Delegates	7.00	9.63	2.63
Free Place	0.00	0.00	0.00
Delegate Income	346.50	272.47	-74.03
Sponsorship	48.90	66.00	17.10
Exhibitors	40.00	25.40	-14.60
Sponsor and Exhibitor Income	88.90	91.40	2.50
Other Income	0.00	1.82	1.82
Total Revenue	435.40	365.69	-69.71



# Expenditure at Lowry and Cathedral



	£ Budget	£ Forecast	£ Variation
Hire of Lowry Facility	95.00	94.71	-0.29
AV at Lowry	58.00	64.55	11.22
Lunch/Tea/Coffee (5 days)	60.00	70.04	10.04
<b>Reception and other Costs</b>	15.00	5.87	-9.13
Lowry Venue Costs	228.00	235.17	11.84
<b>Conference Dinner Venue Hire</b>	4.56	4.00	-0.56
<b>Conference Dinner Food Etc</b>	29.25	38.03	8.78
<b>Conference Dinner Transportation</b>	0.00	4.00	4.00
Other Conference Dinner Costs	7.50	6.43	-1.07
Conference Dinner	41.31	52.96	11.65



# **Management and Marketing**

### Costs



	£ Budget	£ Forecast	£ Variation
NI Management Charge	25.00	25.00	0.00
NAFEMS Charge	8.90	9.14	0.24
Management Fees	33.90	34.14	0.24
<b>Cancellation Insurance</b>	10.00	2.77	-7.23
Public Liability Insurance	0.00	0.00	0.00
Total Insurance	10.00	2.77	-7.23
Printing	10.00	3.74	-6.26
Postage	13.00	0.00	-13.00
Artwork	2.00	1.33	-0.67
Advertising	10.00	1.00	-9.00
Other Marketing	5.00	0.00	-5.00
Marketing Expenditure	40.00	6.07	-33.93

	Website, IASMiRT Dues and Balance						
	£ Budget	£ Forecast	£ Variation				
Web Tool	22.42	9.07	-13.35				
New Website		1.50	1.50				
IASMIRT Dues	21.21	20.71	-0.50				
<b>Total Payments to IASMiRT</b>	43.64	31.28	-12.36				
<b>Delegate Packs and Stationary</b>	10.00	8.32	-1.68				
Credit Card Fees	7.50	7.50	0.00				
Total Miscellaneous Expenses	17.50	15.82	-1.68				
Board Meetings	6.00	1.77	-4.23				
Other Meetings	0.00	1.50	1.50				
Contingency	15.00	1.83	-13.23				
Total Expenditure	435.40	383.29	-52.11				
Total Income	435.40	365.89	-69.51				
Net Contribution	0.00	17.40	17.40				



# **Opening Ceremony**



09:00 to 09:30	Mr Dave Shepherd	Opening Address
09:30 to 10:30	Prof Bob Ainsworth	Jaeger Lecture - Defect Tolerance Arguments in Demonstrating the Structural Integrity of Nuclear Power Plant Components
11:00 to 11:25	Mr David Boath	Nuclear sustainability through collaboration
11:25 to 11:50	Mr Stuart Crooks	Safe reliable nuclear generation over extended lifetimes: an operator perspective
12:50 to 12:15	Dr Andy Hall	The challenge of regulating the nuclear industry in the UK
12:15 to 12:45	Plenary Panel	Bob Ainsworth, David Boath, Stuart Crooks, Andy Hall, Sujit Samaddar and Dame Sue Ion
14:00 to 14:40	Dr Sujt Smaddar	IAEA activities related to SMIRT
14:40 to 15:20	Dame Sue Ion	Realising Nuclear Energy's True Potential - Reaching Beyond the Challenges of Today
15:20 to 15:40	Dr Manus O'Donnell	Overview of Programme including activities for authors and ISC including Early Career Award etc
15:40 to 15:45	Mr Dave Shepherd	Close Opening Session



Sponsors



EDF Energy Generation	Platinum	In kind	EDF energy Generation	Thursday	£ 7,500
Amec Foster Wheeler	Gold	£ 16,000	Atkins Global	Exhibitor	£ 3,500
AASMIRT	Silver	£ 6,500	GERB	Exhibitor	£ 3,500
Hitachi	Silver	£ 6,600	Halfen	Exhibitor	£ 3,500
IAEA	Silver	£ 6,500	HRC Europe	Exhibitor	£ 3,500
ldaho National Labs	Silver	£ 6,500	ММІ	Exhibitor	£ 4,400
Los Alamos National Labs	Silver	£ 6,500	Simulia	Exhibitor	£ 3,500
National Nuclear Labs	Silver	£ 6,500	Steel Bricks	Exhibitor	£ 3,500
Rolls Royce	Bronze	£ 3,500	TOTAL		£ 91,400



**Financial support** 



The Local Organising Committee very gratefully acknowledge that EDF Energy and AMEC Nuclear have committed to underwriting the financial solvency of the conference