



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

**STRUCTURAL MECHANICS in  
REACTOR TECHNOLOGY**

**SMiRT 23**

**Manchester, United Kingdom**

**August 10 to 14 2015**



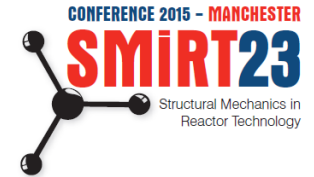
# Overview



- **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



**Peter Ford**

Principal Inspector  
Office for Nuclear Regulation



**Tim Morris**

Sponsorship Organiser  
Chief Executive  
NAFEMS



**Madhu Madhavi**

SMiRT 23 Conference  
Organiser  
Nuclear Institute



**Rachael Macartney**

SMiRT 23 Conference Team  
Communications Officer  
EDF Energy Generation



**Matthew Dawber**

SMiRT Conference Team  
Technical Secretary, ISC  
AMEC Foster Wheeler, Clean  
Energy



**Sonia Shepherd**

SMiRT 23 Conference Team  
Social Programme Co-ordinator



**Christine Waata**

SMiRT 23 Conference Team  
Technical Admin Team  
EDF Energy Generation



**Harris White**

SMiRT Conference Team  
Technical Admin Team  
EDF Energy Generation



# International Scientific Committee



<b>Division I</b>		<b>Division VI</b>	
Dr Andrey Jivkov	University of Manchester, UK	Dr Paul Smith	AMEC FOSTER WHEELER, UK
Prof Daman Panesar	University of Toronto, Canada	Dr Ayman Saoudy	Candu Energy, Canada
Jingsong GUO	EDF Energy, UK	Dr Sanj Malushte	Bechtel, USA
<b>Division II</b>		<b>Division VII</b>	
Prof Steve Garwood	Imperial College, UK	Dr John Llambias	Ristec, UK
Elisabeth Keim	AREVA, Germany	Dr Seichiro Fukushima	TEPCO, Japan
Prof Yun Jae Kim	Seoul University, Korea	Dr Masoud Zedah	Bechtel, USA
Dr Eric Mathet	ATMEA, France	Dr Ravi Ravindra	MKRavindra Consulting, USA
<b>Division III</b>		<b>Division VIII</b>	
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	<b>Division IX</b>	
<b>Division IV</b>		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	<b>Division X</b>	
Shin Morita	Japanese Nuclear Regulation Authority, Japan	Professor Tim Abram	University of Manchester, UK
<b>Division V</b>		Dr Libin SUN	Tsinghua University, China
Prof Colin Taylor	University of Bristol, UK		
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 Manchester
  - Initial contact with NED editor but subsequently no responses
  - Diverse approaches under consideration



# Programme



Room	Monday				Tuesday				Wednesday				Thursday				Friday					
	9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:25 to 18:00	9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:25 to 18:00	9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:25 to 18:00	9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:25 to 18:00	9:00 to 10:30	11:00 to 12:45	14:00 to 15:45	16:25 to 18:00		
Lyric	Opening Session Dave Shepherd, Bob Alnoworth	Plenary Session David Booth, Crooks, Andy Hall	Plenary Session Stuart Smith, Dame Sue Ion, Marcus O'Donnell, Dave Shepherd	Division V Seismic Re-evaluation	Plenary SMRs	Division VI International Research and Codification Activities for Steel-Plate Concrete (SC) Structures	Division IX Decommissioning - Current situation of Fukushima current research activities.	Required by Lowry	Plenary Flooding Post Fukushima	Division VII Risk-Informed Regulatory Frameworks for External Hazards	NUSDNA - Integration of National RDD Programmes 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 Hoisting and Revenberg, 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			
Quays				Division V Airborne Missiles Assessment	Division V Seismic - 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 Seismic - SSI Response and Methodology	High Temperature Assessment Workshop 1	High Temperature Assessment Workshop 2		Division V Seismic Response of Pile Foundations	Division IX Concrete degradation mechanisms	Division II Fatigue Assessment of Components	Division II Fracture Assessment Methodologies	Division II Ductile Temperature, Creep and Fatigue					
Quays				Division II Cracking in AGR Graphite	Division II Microstructural Considerations of Graphite	Division V Seismic Qualification	Division V Developments in Seismic Isolation	Division V Piping and Distribution of Systems	Division VII Fragility and Experience Data	Division V Seismic Response of Anchors	Division VII Design Extension Conditions		Division II European Codes and Track in Fracture Mechanics	Division V Seismic Response of Components	Division II RPV Integrity Considerations	Division V Concrete Capacity Analysis	Division VII Probabilistic Safety Analysis - Phase Applications					
Studio 1				Division V Seismic Response Testing	Division II Application of Experimental Testing	Division V Seismic - SSI and SSI Techniques	Fatigue and Fracture in Steels	Division V Effect of Concrete Parameters on Impact Capacity	Division V Seismic Response Analysis of Structures	Division V Site Response	Division I HDR		Division I RPV Embrittlement	Division II Engineering Analysis and Simulation Competency in the Nuclear Sector	UK Forum for Engineering Structural Integrity (ESI) Workshop	Division I Testing for Material Properties	Division II Vibration and Dynamic Analysis					
Studio 2				Division II Structural Performance of Multi-Metal Project	Division II Innovative Simulation of Components	Division II Application of Finite Element Techniques	Division VII Risk Assessment Applications	Division V Seismic Isolation Evaluation Method	Division II Ductile Fracture Assessment and Practical Applications	Division V Fluid Structure Interaction Considerations in Response of Structures	Division V Fluid Structure Interaction Considerations in Response of Components		Division II Simulation of Severe Accident Interactions	Division V Impact and Damage Evaluation	Division V Impact in Fuel Storage Facilities	Division V Fluid Structure Interaction	Division V Modelling Considerations in Response of Components					
Heaven				Division V Base Isolation Design Issues	Division V Base Isolation Response Issues	Division V Response of Buried Structures	Division VII Aging Management of Concrete Structures	Division V Seismic Margins and Shear Walls	Division VII Seismic Margins - Case Studies	Division II Application of Fluid Dynamics	Division II Evaluation Schemes		Division VII Plant Reliability Initiatives	Division II Fatigue Crack Growth	Division V Seismic - SSI Response and Considerations	Division V Seismic Response and Ground Motion Effects	Division II Soil Structure Interaction and Non-Linear Considerations					
Deck 1				Division II Constraint Effects and Residual Stresses	Division II Residual Stresses and Defect Interactions	Division V Concrete Impact Capacity Testing	Division VI Component Design Issues		Division VI Constraint	Division VI Safety Considerations of Reinforced Concrete Structures	Division VI Design for Hazardous Loading Situations		Division I Welding and Fabrication	Division I Concrete Degradation Mechanisms	Division VII Risk Informed Decisions	Division VI Steel Concrete Composite Structures	Division VI Steel Concrete Structures - Design					
Studio 2				Division VII External Hazards		Division I Concrete - Marine Environments and Chloride Attack	Division VII Seismic Margins - Methods	Division VI Application of State of Concrete Components to DWRs	Division I Concrete - Temperature Effects	Division II SMIRT 2015	Division II Effect of Embrittlement on SSI Response		Division VI Vibration and Impact Issues	Division X Considerations of Loyal Metal Reactor Design	Division IV Earthquake Hazard and Site Response	Division VII Probabilistic Safety Analysis - Methods and Uncertainties	Division VII Determination of Fragility by Analysis					
Terrace				Division VII Mitigation Approaches for Extending NPP Component Service Life	Division VII Aging Management	Division II Seismic Hazard Methods and Applications	Division VII Non-seismic Fragilities	Division VII Severe Accidents		Division II Graphite Fracture	Division VII Fragility of Aircraft Impact Hazard		Division VI Fragility of Structures	Division VII Probabilistic Safety Analysis - Analysis Factors	Division VII Effect of Base Isolation on Fragilities	Division VII Monitoring and NDE/PA of Concrete						
South Room				Division IV Flood Hazard and Local Perturbation Effects	Division V Aircraft Impact	Division II Fatigue Considerations for Long-term Operation	Division VII Optimisation Strategies for NPP Maintenance Planning	Division VII Development of Fragility Techniques	Division VII Fragility of Mechanical Components	Division X Design Features and Studies	Division X Reactor Design Evaluation and Regulation		Division VI Regulations, Regulations, and Methodology	Division VII Non-linear Evaluation and Human Factors	Division I Concrete - SSI & Aggregate Reaction							
Deck 2				Division II Aircraft Impact	Division II Modelling of Fuel Assembly	Division II Analysis and Modelling of Mechanical Components	Division II Modelling and Simulation Applications	Division II Modelling of Reactor Cores	Division VII In-service Inspection and Monitoring	Division IX Fuel Packaging and Storage	Division IX Decommissioning Hazards		Division X Design Considerations of Steel Structural Concrete	Division VI Fatigue and Anchorage	Division II Leak Before Break							

# Summary of Focused Sessions

Tuesday				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 Decommissioning - 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 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
	Division VII State-of-the-art session on component fragility of NPP	Nuclear Applications of Graphite Workshop 1	Nuclear Applications of Graphite Workshop 2		High Temperature Assessment Workshop 1	High Temperature Assessment Workshop 2			Division IX Concrete degradation mechanisms				
		Division V Developments 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.

[Click here](#)  
[for more info](#)  
[& to buy tickets](#)



## 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.

[Click here](#)  
[for more info](#)  
[& to buy tickets](#)



## 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.

[Click here](#)  
[for more info](#)  
[& to buy tickets](#)



## 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.

[Click here](#)  
[for more info](#)  
[& to buy tickets](#)



## 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!

[Click here](#)  
[for more info](#)  
[& to buy tickets](#)



## Evening Tours

[Monday 10 August](#) | [The Oxford Road Corridor](#)  
[Tuesday 11 August](#) | [Castlefield Tour](#)  
[Wednesday 12 August](#) | [Summer Party Cruise](#)

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

# Dinner Venue

- Founded in 1215 on earlier Saxon church
- Situated in central Manchester – few minutes walk from most hotels
- Established venue for Gala dinners





# 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**

### **14<sup>th</sup> International Seminar on FIRE SAFETY IN NUCLEAR POWER PLANTS AND INSTALLATIONS**

#### **ORGANIZERS**

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# Post-SMiRT 23 Seminar



Post-SMiRT 23 Seminar  
[www.postsmirtistanbul.org](http://www.postsmirtistanbul.org)

October 21 - 23, 2015  
İstanbul, TÜRKİYE



## Post-SMiRT Seminar on **NEW BUILD NUCLEAR POWER PLANT DESIGN and SAFETY CONSIDERATIONS**

### CALL FOR ABSTRACTS

The purpose of this seminar 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 issues related to upstream activities in a new build project will be discussed. These will include the required infrastructure, site related issues and design features that needs to be reviewed to evaluate the feasibility of the project. The seminar will also address concerns resulting from the Fukushima accident on site evaluation and design of new projects. Over 3 days, the seminar will address the following areas:

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

The participants include major industry representatives from Turkey, Japan, China, US and European countries. The seminar 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.

The seminar ([www.postsmirtistanbul.org](http://www.postsmirtistanbul.org)) is to be held at the Hilton ParkSA Hotel in İstanbul, Türkiye, from 21 to 23 October 2015.

We invite authors to submit abstracts for oral presentation at the Post-SmiRT23 Seminar in İstanbul. We look forward to see your benign presence with active contribution and support to make this event successful.

#### Important dates

Opening of Abstract submission: July 28<sup>th</sup>, 2015

Deadline for Abstract submission: August 10<sup>th</sup>, 2015

Sincerely Yours,

**Dr. Aybars Gürpınar,**  
Chairman

Post-SMiRT 23 Seminar Secretariat:

Dr. Yalçın Bulut, Turgut Özal University  
Email: [ybulut@turgutozal.edu.tr](mailto:ybulut@turgutozal.edu.tr)

Dr. Ömer O. Erbay, MATRİSob  
Email: [ooerbay@matrisob.com](mailto:ooerbay@matrisob.com)

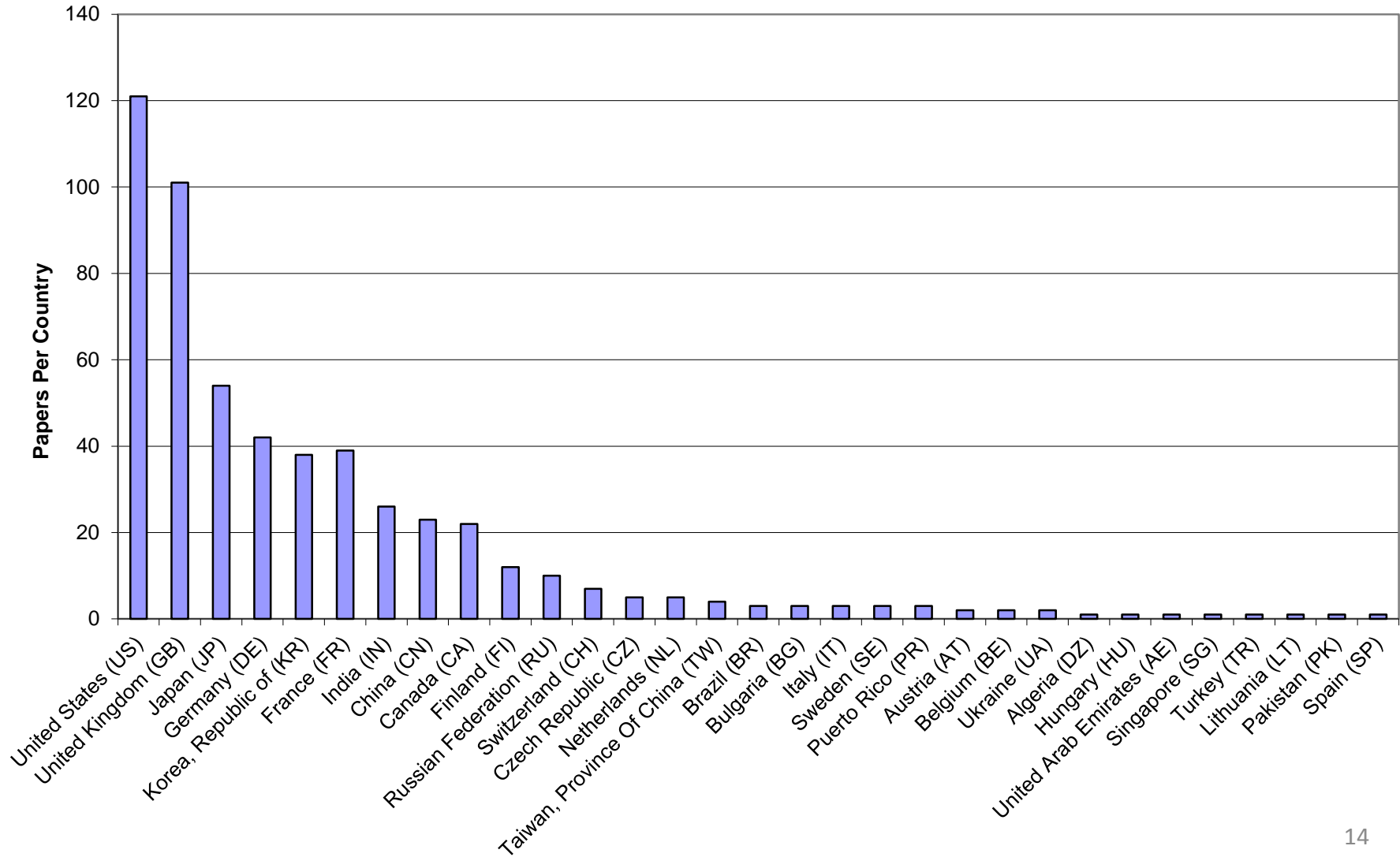


# Web Site

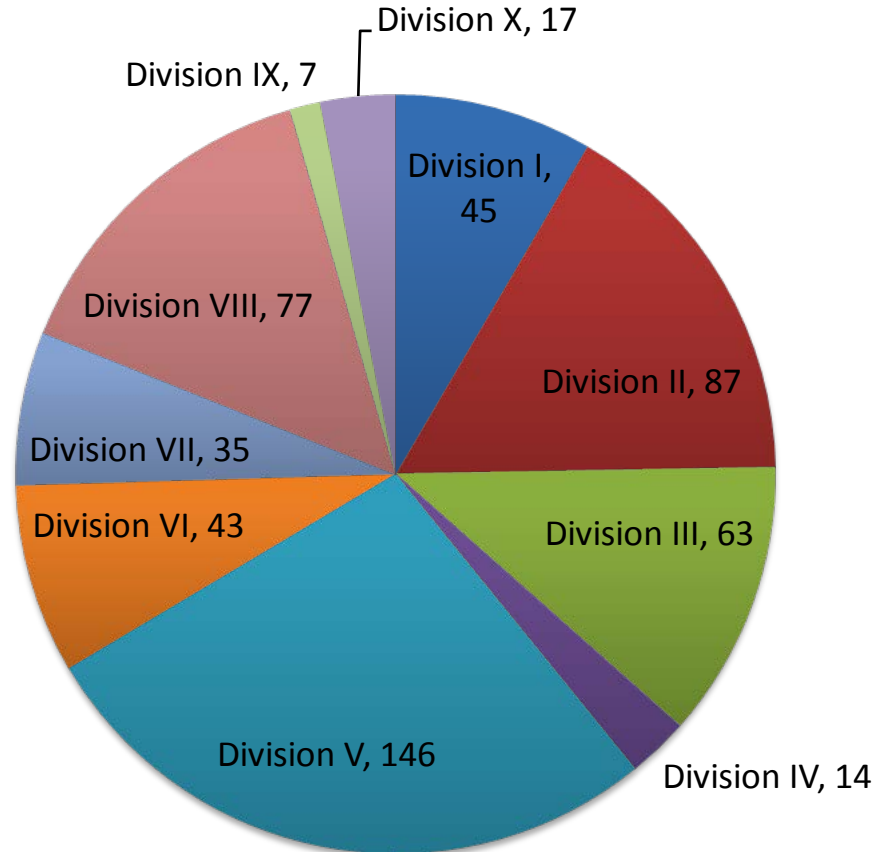


- Webtool difficulties – never resolved all issues
- January 2015 hacking problems
- Alternative Website established February 2015
- Not all features of Webtool replicated
- Ownership of solution important – cannot resolve complex issues across three continents

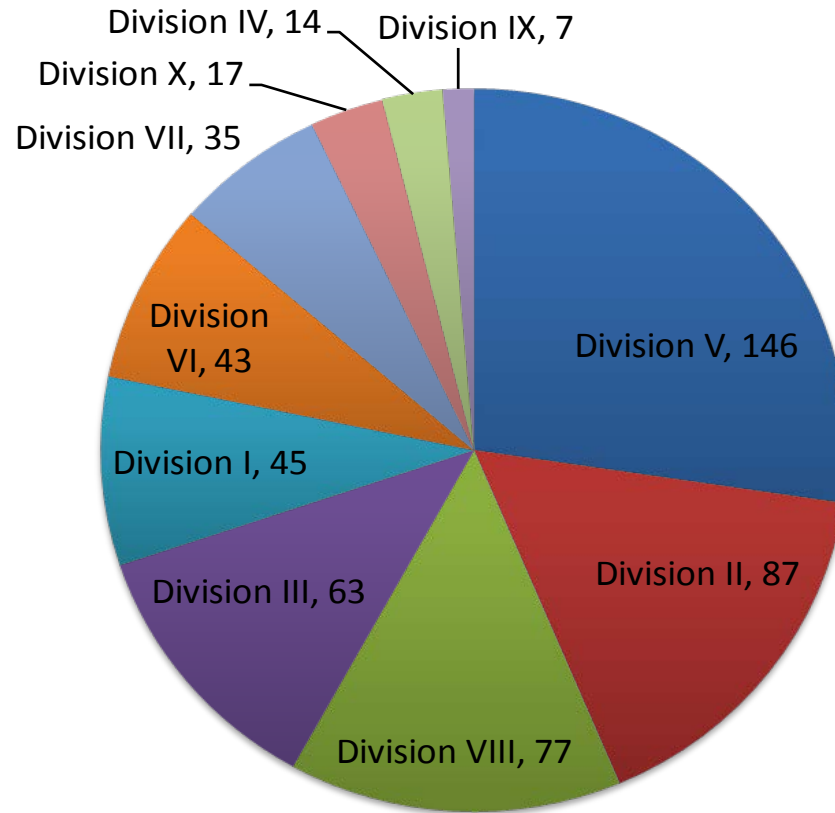
# Papers by Country



# Papers by Division

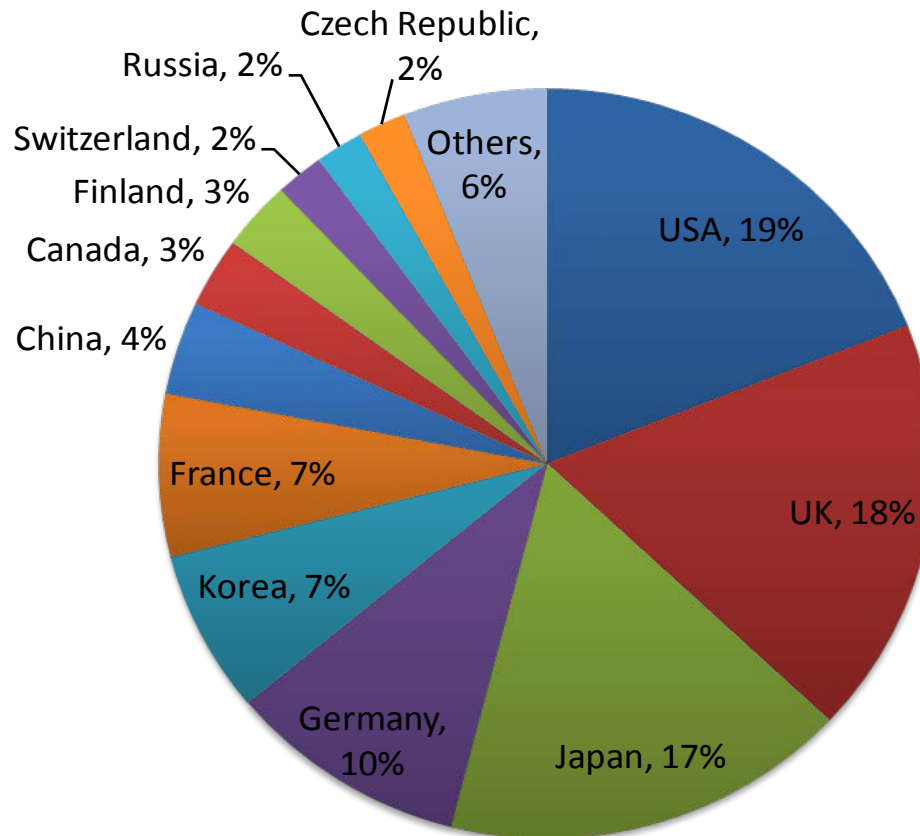


# Papers by Division





# Delegates by Country





# Summary of Paid Delegates



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

# 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
<b>Delegate Income</b>	<b>346.50</b>	<b>272.47</b>	<b>-74.03</b>
Sponsorship	48.90	66.00	17.10
Exhibitors	40.00	25.40	-14.60
<b>Sponsor and Exhibitor Income</b>	<b>88.90</b>	<b>91.40</b>	<b>2.50</b>
Other Income	0.00	1.82	1.82
<b>Total Revenue</b>	<b>435.40</b>	<b>365.69</b>	<b>-69.71</b>

# Expenditure at Lowry and Cathedral

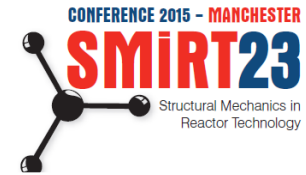
	£ Budget	£ Forecast	£ Variation
Hire of Lowry Facility	95.00	94.71	-0.29
AV at Lowry	58.00	64.55	11.22
Lunch/Tea/Coffee (5 days)	60.00	70.04	10.04
Reception and other Costs	15.00	5.87	-9.13
<b>Lowry Venue Costs</b>	<b>228.00</b>	<b>235.17</b>	<b>11.84</b>
Conference Dinner Venue Hire	4.56	4.00	-0.56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

# Management and Marketing Costs

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



# 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>	<b>43.64</b>	<b>31.28</b>	<b>-12.36</b>
Delegate Packs and Stationary	10.00	8.32	-1.68
Credit Card Fees	7.50	7.50	0.00
<b>Total Miscellaneous Expenses</b>	<b>17.50</b>	<b>15.82</b>	<b>-1.68</b>
Board Meetings	6.00	1.77	-4.23
Other Meetings	0.00	1.50	1.50
Contingency	15.00	1.83	-13.23
<b>Total Expenditure</b>	<b>435.40</b>	<b>383.29</b>	<b>-52.11</b>
<b>Total Income</b>	<b>435.40</b>	<b>365.89</b>	<b>-69.51</b>
<b>Net Contribution</b>	<b>0.00</b>	<b>17.40</b>	<b>17.40</b>



# 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



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





# Financial support



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# SMiRT 23 – Any Questions?

