



# ISAF Evaluation Processes and Information

## *Women's Skiff and Mixed Multihull Evaluation*

### *Equipment for the 2016 Olympic Sailing Competition*

#### 1. Summary

This report describes the evaluation processes for a Women's Skiff and Mixed Multihull for the 2016 Olympic Sailing Competition. The results and recommendations of the evaluation are contained within the ISAF Women's Skiff and Mixed Multihull Evaluation Report and Recommendations.

By kind invitation from the Spanish Sailing Federation, RFEV; the 2016 Equipment Evaluation event was held at the Prince Felipe High Performance Sailing Centre, Santander, Spain from 17 March to 25 March 2012.

The equipment evaluations were conducted considering the aims of Regulation 23.1.2 and in accordance with ISAF Regulation 23.1.3(c)

6 skiff boats and 7 multihulls entered and were accepted for the evaluation. See section 3 for the list of boats and their representatives. The boats have undergone a complete technical evaluation detailed in section 5. The boats were sailed by nominated MNA sailors in a variety of conditions ranging from 5 knots in flat conditions to over 20 knots in wavy conditions more information can be seen in section 7.

The evaluation panel consisted of 8 representatives from AUS, AUT, CRO, ESP, FIN, GBR, GER, PUR and 3 ISAF staff from the Technical Department. A list of the evaluation team and more information can be seen in Section 4.

There were 44 nominated MNA sailors from the following 23 countries – AUS, BUL, CAN, CZE, DEN, ESP, FRA, GBR, GER, GRE, GUA, ITA, JPN, NED, NOR, NZL, POL, RUS, SIN, SUI, SWE, THA, USA. More information can be seen in section 6. The list of sailors can be seen in Appendix 1. For the multihull or skiff, sailors tried each boat type in rotation at least twice, in a range of conditions. Each sailor (helm and crew) gave feedback using the following; boat specific questionnaires after a sailing session, meetings with the evaluation panel and also an end of evaluation questionnaire. 207 multihull boat specific questionnaires and 245 skiff boat specific questionnaires were received during the period of the evaluation.

The evaluation event was covered by ISAF Media and also many other media representatives in attendance. A diary and blog of the evaluation event can be seen here:

<http://www.sailing.org/classes/2016-Equipment-Evaluation.php>

Some pictures of the event can be seen here: <http://www.flickr.com/photos/isafmedialibrary/>

#### 2. Background and Objective

In May 2011 ISAF Council made a decision to adopt submission M10-11 to include the "Women's Skiff – Evaluation" and "Mixed Multihull – Evaluation" in the events for the 2016 Olympic Sailing Competition. Following work on the development of the criteria for each respective event ISAF released the Request for Proposals for the Women's Skiff and Mixed Multihull In September 2011 to solicit bids for suitable equipment from manufacturers and classes with a deadline at the end of January. All equipment bids submitted were accepted to attend the evaluations.

In November 2011, ISAF Council received the Request for Proposals and decided that the Equipment Committee were asked to do everything reasonable to provide Council with a report in sufficient time on the equipment evaluation event to decide the equipment for the events in May 2012. Following subsequent investigation it was decided that the evaluations should take place in Santander, Spain from 17 to 25 March 2012.

## **Women's Skiff and Mixed Multihull – Evaluation Process**

In January 2012, national authorities were invited to nominate their national sailors to attend the evaluation. All national authorities who applied were invited to take part, limited to 2 Women Skiff sailors and 2 Mixed Multihull Sailors.

The evaluation panel was subsequently formed and ratified by the ISAF Equipment Committee and Executive Committee.

### **3. The Boats and Entrants**

All boats that entered a proposal for the evaluation were invited to attend. Invitations were sent out at the beginning of February. The entrant teams attended with at least 2 each of their boats and also supplied a number of their own sailors to coach and look after the boats.

The entrant teams were responsible for rigging the boats and any spares and maintenance required. The cooperation of the entrant teams was greatly appreciated during the evaluation.

The boats and representative that attended the evaluation are as follows:

#### **Women's Skiff**

29erXX – Ovington Boats

Representatives: Jen Morgan-Glass, Jerelyn Biehl, Felicitas Roldan, Chris Turner

Aura – Ovington Boats

Representatives: Chris Turner, Peter Hobson, Michael Thaarup

ARUP Skiff – ARUP

Representatives: Roland Trim, Matthew Kiddle, Hayley Trim, Harriette Stone

Hartley Rebel – Hartley Boats

Representatives: Derek Clark, Tim Coventry, (Richard Hartley)

RS900 – RS Sailing

Representatives: Martin Wadhams, Alex Southon, Nicola Groves, Christina Bassadoni

Mackay FX – Mackay Boats.

Representatives: Dave Mackay, John Clinton, (Alexandra Maloney, Molly Meech)

#### **Mixed Multihull**

Hobie 16 & Hobie Tiger – Hobie Cat

Representatives: Jean-Francois Collet, Michel Corigliano, Fernando León

NACRA F16 & NACRA 17 – NACRA Sailing International

Representatives: Gunnar Larsen, Peter Vink, Grant Piggott, Menno Vercouteren

Spitfire S – Sirena Loday White

Representatives: Yves Loday, Robert White, Benjamin Dutreux, Jonathan Loday

Tornado – International Tornado Class Association

Representatives: Roland Gaebler, Nahid Gaebler, Goran Marstrom, Sarah Jentsch

Viper F16 – Australian High Performance Catamarans (AHPC)

Representatives: Greg Goodall, Brett Goodall, Carolijn Brouwer, Jason Waterhouse

### **4. Evaluation Panel and ISAF Representatives**

The Evaluation Panel consisted of expertise from around the World and included ISAF committee representatives and ISAF staff. The panel consisted of expertise in sailing, technical, events, medical and other relevant disciplines. Experts on the Evaluation Panel were expected to be impartial and conflicts of interest forms were lodged with the ISAF secretariat.

## Women's Skiff and Mixed Multihull – Evaluation Process

The Evaluation Panel as agreed by the Equipment Committee was as follows:

### Evaluation Management Panel

- Dick Batt (GBR) – Evaluation Chairman (Chairman of ISAF Equipment Committee)
- Nadine Stegenwalner (GER) – Evaluation Management Events (ISAF Events Committee member, ISAF Match Racing Committee member, ISAF Women's Forum)
- Georg Tallberg (FIN) – Evaluation Management Technical (Chairman of ISAF Class Rules Sub-committee, ISAF Equipment Committee member)
- Dr Nebojša Nikolic (CRO) – ISAF Medical Commission (not present in Santander)
- Jason Smithwick (ISAF) – Head of ISAF Technical & Offshore Department

### Women's Skiff and Mixed Multihull Evaluation Panel

- Adrienne Cahalan (AUS) – Women's Skiff (ISAF International Regulations Commission, ISAF Women's Forum)
- Enrique Figueroa (PUR) – Mixed Multihull
- Sylvia Vogl (AUT) – Women's Skiff and Mixed Multihull (ISAF Development and Youth Committee, ISAF Women's Forum)
- Alejandro Abascal (ESP) (ISAF Events Committee) (Local Organisation)
- Simon Forbes (ISAF) – ISAF Technical and Offshore Manager
- Henry Thorpe (ISAF) – ISAF Technical Coordinator

### Also in Attendance

Goran Petersson (SWE) ISAF President  
Teresa Lara (VEN) ISAF Vice President  
Jerome Pels (ISAF) ISAF Secretary General

### ISAF Media

- Daniel Smith (ISAF) – ISAF Website & Media Coordinator

### Local Organisation

- Antonio Bolado (ESP)

## 5. Technical Evaluation

The technical evaluation of the boats was examined using a comparison spreadsheet of key technical aspects of the boat from documentation submitted by the entrants. During the technical evaluation a colour coding system was used as a tool to simply highlight any areas of concern within the building specification and then any narrative added to the boat reports to reflect this. The evaluation included the following areas and sub-sections (this list is not exhaustive):

**Principal Data** - This section includes the primary dimensions, weights and areas of the boat, appendages, rig and sails.

**Hull and Deck** – this section considers the following:

Builders – continental regions, production capacity  
Materials and specifications – resins, gelcoat, laminate, skins, cores  
Structural reinforcement – layout, bonding methods  
Mouldings and tooling – master tooling, mould construction, production moulds  
Construction process – structural moulding hull to deck bonding, case alignment  
Construction manual – process, sequencing, quality control and checks, tolerances  
Maintenance – access, buoyancy compartments and floatation materials

**Appendages** - this section considers the following:

Daggerboard(s), Centreboard(s) and Rudder(s)  
Builders – continental regions, production capacity  
Materials and specifications – resins, gelcoat, laminate, skins, cores  
Structural reinforcement – layout, bonding methods

## **Women's Skiff and Mixed Multihull – Evaluation Process**

Mouldings and tooling – sources, production tooling  
Construction process – structural moulding bonding.  
Construction manual – process, sequencing, quality control and checks, tolerances  
Maintenance – repairing damage

**Spars and Rigging** - this section considers the following:

Mast, Boom, Bowsprit, Standing Rigging  
Manufacturers – locations, production capacity, manufactures of rig parts; tube, spreaders etc.  
Details – watertight, dimensions, bare tube weight  
Materials – specifications, method, layout, resins, electrical isolation  
Structural reinforcements -  
Mouldings – master tooling, mould construction  
Construction manual - process, sequencing, quality control and checks, tolerances  
Maintenance - Flotation

**Sails** – this section considers the following:

Mainsail, Jib and Gennaker, Battens  
Manufacturers – locations, production capacity  
Materials – specifications and layout  
Construction process – sequence and pattern, quality control  
Construction manual  
Maintenance

**Distributors** – this section considers builder and dealer distribution in the continental regions.

**Shipping** – this section considers transport of hulls, masts and full boats including container options and other shipping options.

**Costs** – this section considers the following:

Cost of boat to build  
Price of boat and any offers for MNAs or initial batch  
Part costs – spars, spar parts, appendages  
Sail costs – mainsail, jib, gennaker and battens  
Other costs – e.g. upgrade options

**Class data and distribution** – this section includes the following:

Class Rules – ISAF format and suitability for competition.  
International Class Association – Class executive, AGMs, forming a subsection of another class  
Worldwide distribution and national class associations – numbers around the world

**Evaluation Data** – this section includes technical observations of the following:

Launch, capsize recovery and retrieval  
Course sailing – upwind, downwind, restricted course  
Manoeuvres – tacking, gybing  
Boat park – boat park width, time to remove wings etc.  
Media appeal and styling

ISAF considered any specific building information, such as material schedules and construction manuals, as proprietary and confidential. The information was only viewed by the ISAF staff unless we sought express permission from the entrant to distribute it to individuals outside of the staff.

Boats were checked during the evaluations for conformity with documentation and information submitted.

## Women's Skiff and Mixed Multihull – Evaluation Process

### 6. MNA Evaluation Sailors

MNAs were invited to nominate sailors to the evaluation trials and there were a substantial number of applications. A sailor was accepted if the MNA approved the application. Sailors were asked to declare their physical data, dinghy sailing experience over the past two years, level of racing and conflict of interest. There were many applicants and in general nations were limited to 2 sailors for the Women's Skiff evaluation and 2 sailors for the Mixed Multihull evaluation.

There were 44 MNA nominated sailors from the following 23 countries – AUS, BUL, CAN, CZE, DEN, ESP, FRA, GBR, GER, GRE, GUA, ITA, JPN, NED, NOR, NZL, POL, RUS, SIN, SUI, SWE, THA, USA. The list of sailors can be seen in Appendix 1. A number of the teams also had team leaders or coaches in attendance.

There was a wide range of experience and sailor's ability at the evaluations. Some sailors were experienced in the boat types and some were less experienced. In general it was noticeable how many of the less experienced sailors quickly obtained the techniques and skill to sail the types of boats at the evaluation. All the sailors were highly engaged in the evaluation process, providing clear, useful and incisive feedback throughout the process.

The multihull or skiff specific sailors tried each boat type in rotation at least twice for those that attended the whole 9 days. Each sailor gave feedback in the form of boat specific questionnaires after every sailing session, feedback meetings with the evaluation panel and also in an end of evaluation final questionnaire. The two questionnaires can be seen in Appendix 2 and Appendix 3 respectively.

The sailor's physical data are as follows:

#### Women's Skiff Sailors

	<b>Average</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Weight – kg</b>	59.7	46	74
<b>Height – metres</b>	1.67	1.50	1.80
<b>Age – years, months</b>	23 y 7 m	16 y	36 y

#### Mixed Multihull Men

	<b>Average</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Weight – kg</b>	76.8	67	88
<b>Height – metres</b>	1.80	1.70	1.93
<b>Age – years, months</b>	29 y 10 m	19 y	44 y

#### Mixed Multihull Women

	<b>Average</b>	<b>Minimum</b>	<b>Maximum</b>
<b>Weight – kg</b>	59.7	51	66
<b>Height – metres</b>	1.67	1.60	1.75
<b>Age – years, months</b>	28 y 3 m	22 y	37 y

## Women's Skiff and Mixed Multihull – Evaluation Process

### 7. Evaluations Sailing

Evaluation sailing consisted of a morning and afternoon session where sailors would sail up to 4 of each boat by switching primarily on the water. During the evaluation a range of conditions were experienced from 5 knots to over 20 knots in flat water and waves. Sailing courses were located inside the harbour and outside in Santander bay.

The following table details the conditions and type of sailing for each day of the evaluation:

Date	Conditions	Type of sailing and notes
17 March	5 knots then increasing to over 20 knots Flat water then short medium waves	Free sailing around a course, capsize recovery in the harbour. Each sailor sailed 1 boat type in the skiff and 2 boat types in the multihull
18 March	25 to 35 knots	No sailing, too windy
19 March	10 to 14 knots Short small waves	Free sailing around a course, capsize recovery in the harbour Each sailor sailed 4 boat types in the skiff and the multihull
20 March	7 to 14 knots Short small waves	Free sailing around a course and informal starts and racing in the harbour. Each sailor sailed 2 boat types in the skiff and multihull
21 March	0 to 5 knots	No sailing, no wind
22 March	5 to 8 knots Medium wave condition	Informal starts and racing outside in Santander bay. Each sailor sailed 2 boat types in the skiff and multihull
23 March	12 to 18 knots Large wave condition	Informal starts and racing outside in Santander bay. Boat entrant sailors within the weight range sailed their 1st boat. Selected MNA sailors sailed 2 of each boat type.
24 March	5 to 12 knots Medium wave condition	Informal starts and racing outside in Santander bay. Each sailor sailed 2 of each boat type Some boat entrant sailors sailed the 2nd boat if spare.
25 March	0-5 knots	No sailing, no wind

### 8. Boat Entrant's Interviews

During the evaluation, members of the Evaluation Panel met representatives of each boat in turn, in a private session which consisted of a 30 minute presentation and relevant questioning made by the Evaluation Panel. At these meetings each entrant was limited to not more than four representatives.

Entrants were questioned on many aspects including current and planned production locations and volume capabilities, on prices after import and other taxes in typical countries in the major economic areas of the world. Entrants were also questioned on the future relationship with ISAF, on controlled distribution and the boat pricing structure.

## **Women's Skiff and Mixed Multihull – Evaluation Process**

### **9. Evaluation Report**

The evaluation of the boats includes the feedback from the MNA sailors. An analysis of the sailor questionnaire data was conducted that includes 9000 data points and hundreds of comments.

Evaluation of the boats are accompanied by an explanation narrative written to describe the boats and any concerns. The narrative reflects the conclusions of the discussions had by the Evaluation Panel.

### **10. Medical Commission Considerations**

The Medical Commission representative on the Evaluation Panel recommended related questions on the sailor evaluation feedback forms. Sailors were asked about how physically demanding the boats were and to report any physical injury while sailing the boats.

## Women's Skiff and Mixed Multihull – Evaluation Process

### Appendix 1 – MNA Sailors

#### Women's Skiff Sailors

First Name	Last Name	Country	Gender	Notes
Danielle	Boyd	CAN	F	
Emily	Hill	CAN	F	
Cassandre	Blandin	FRA	F	
Marion	Leprunier	FRA	F	
Kenji	Nakamura	JPN	M	
Megumi	Taniguchi	JPN	F	
Alexandra	Maloney	NZL	F	Also acted as Mackay FX works team sailors
Molly	Meech	NZL	F	
Cecilia	Low	SIN	F	
Rachel	Lee	SIN	F	
Paola	Bergamaschi	ITA	F	
Tezza	Lavinia	ITA	F	
Hanna	Klinga	SWE	F	
Sara	Engstrom	SWE	F	
Nathalie	Keller	SUI	F	
Haylee	Outteridge	AUS	F	
Katrina	Hughes	GBR	F	
Penny	Clark	GBR	F	
Marie	Thusgaard Olsen	DEN	F	
Ida Marie	Baad Nielsen	DEN	F	
Tara	Pacheco	ESP	F	
Berta	Betanzos	ESP	F	
Helene	Nass	NOR	F	
Kristin	Nyland	NOR	F	
Noppakao	Poonpat	THA	F	Sailed 29erXX, Arup and RS900

#### Multihull Cat Sailors

First Name	Last Name	Country	Gender	Notes
Mary	Rook	GBR	F	
Steven	Lovegrove	GBR	M	
Henriette	Gruse	GER	F	Also sailed women's skiffs
Maximilian	Said	GER	M	
Arnaud	Jarlegan	FRA	M	





## Women's Skiff and Mixed Multihull – Evaluation Process

First Name	Last Name	Country	Gender	Notes
Anne-Claire	Le Berre	FRA	F	
Ceeline	Van Dooren	NED	F	
Thijs	Visser	NED	M	
Sarah	Newberry	USA	F	
Matthew	Whitehead	USA	M	
Maria	Alexandrova	BUL	F	
David	Krizek	CZE	M	
Matteo	Nicolucci	ITA	M	
Ermioni-Nonika	Oikonomopoulou	GRE	F	
Jason	Hess	GUA	M	
Meike	Schomaker	GER	F	Also sailed women's skiffs
Marcin	Badzio	POL	M	
Maxim	Semenov	RUS	M	
Miguel	Perez	ESP	M	




# Women's Skiff and Mixed Multihull – Evaluation Process

## Appendix 2 – Individual Boat Questionnaire

MNA Sailors Boat Questionnaire		Santander Spain - 17-25 March 2012			
	please circle as appropriate			Sailor name:	
	Women's Skiff:	29erXX Rebel	Arap Skiff Mackay FK	Aura RS900	Country code:
					Sailing with:
Mixed Multihull:	please circle as appropriate			Date tested: _____ March 2012	
	Hobie16	Tiger	Macra 17	Time of sailing: _____ : _____ hrs	
	Macra F16	SpitfireS	Tornado		
	Viper			Position: Helm <input type="checkbox"/> Crew <input type="checkbox"/> Both <input type="checkbox"/>	
				Wind strength: Strong <input type="checkbox"/> Medium <input type="checkbox"/> Light <input type="checkbox"/>	
				Water Condition: Flat <input type="checkbox"/> Waves <input type="checkbox"/> Both <input type="checkbox"/>	
	Rating please tick your choice				
	Good	Average	Bad		
					
<b>1 Launch &amp; Recovery</b>				<b>Any Comments/ Notes</b>	
a. Ease of launching					
b. Ease of recovery					
<b>2 Preparation to Sail</b>					
a. Ease of rigging					
b. Ease of sail hoisting (main and jib)					
c. Ease of rudder and board tilting					
<b>3 Upwind sailing</b>					
a. What was your feeling of sailing the boat upwind					
b. Course stability and steering					
c. Tacking					
d. Jib sheet loads					
e. Main sheet loads					
<b>4 Reaching sailing</b>					
a. What was your feeling of sailing the boat reaching					
b. Course stability and steering					
<b>5 Downwind sailing</b>					
a. What was your feeling of sailing the boat downwind					
b. Course stability and steering					
c. Ease of genaker hoist and drop					
d. Gybing					
e. Genaker sheet loads					
f. Bear away / Pitchpoling					
<b>6 Handling</b>					
a. Control lines loads (e.g. downhaul/vang)					
b. Effectiveness of controls for trimming					
c. Control lines arrangement / layout					
d. Physical effort of helmsperson				<i>Good = physically easy to sail; Bad = physically demanding to sail</i>	
e. Physical effort of crew				<i>Good = physically easy to sail; Bad = physically demanding to sail</i>	
f. Your weight suitability				<i>If bad then were you too heavy / too light? (circle as appropriate)</i>	
g. Your height suitability				<i>If bad then were you too tall / too short? (circle as appropriate)</i>	
h. Helmsperson and crew position options					
i. Pre-start manoeuvring					

# Women's Skiff and Mixed Multihull – Evaluation Process


## Appendix 2 – Individual Boat Questionnaire – continued

	Rating please tick your choice								
	Good	Average	Bad						
									
<b>7 Sailing in Waves</b>									
a. Behavior of the boat in waves									
b. Course stability and steering									
<b>8 Capsize Recovery</b> (if applicable)									
a. Resistance to invert to 180 degrees									
b. Ease of slowing gennaker while capsized									
c. Ease of preparing the boat for righting									
d. Ease of righting									
e. Ease of crew re-boarding									
f. Speed of cockpit draining (skills)									
<b>9 Overall Impression</b>									
a. What is your feeling about the boat									
b. What was your feeling of the challenge of the boat									
c. How exciting is the boat									
<b>10 Further Comments</b>									
a. Potential equipment failures or design faults									
b. Any parts of the boat considered dangerous									
c. Personal injuries sustained while sailing									
d. Other general comments									

Women's Skiff and Mixed Multihull – Evaluation Process

Appendix 3 – End of Evaluation Questionnaire

Skiff Example (Multihull is identical but with the multihull boat names)

	<b>Women's Skiff</b>		<b>Santander Spain - 17-25 March 2012</b>			
	<b>MNA Sailors Final Questionnaire</b>					
<b>Sailor name:</b>						
<b>Country code:</b>						
<b>Sailing with:</b>						
<b>Primary Position:</b>		<b>Helm</b>		<b>Crew</b>	<i>please tick as appropriate</i>	
<i>Rating - please tick as appropriate</i>						
<b>1</b>	<b>How good was the general boat handling?</b>	<b>Very good</b>	<b>Good</b>	<b>Average</b>	<b>Below average</b>	<b>Bad</b>
	29erXX					
	Arup Skiff					
	Aura					
	Rebel					
	Mackay FX					
	RS900					
<b>2</b>	<b>How demanding is the boat to sail?</b>	<b>Very demanding</b>	<b>Above average</b>	<b>Average</b>	<b>Below average</b>	<b>Not demanding</b>
	29erXX					
	Arup Skiff					
	Aura					
	Rebel					
	Mackay FX					
	RS900					
<b>3</b>	<b>How suitable is your size and strength for the boat?</b>	<b>Very suitable</b>	<b>Above average</b>	<b>Average</b>	<b>Below average</b>	<b>Not suitable</b>
	29erXX					
	Arup Skiff					
	Aura					
	Rebel					
	Mackay FX					
	RS900					
<b>4</b>	<b>How good is the general quality of the boat?</b>	<b>Very good</b>	<b>Good</b>	<b>Average</b>	<b>Below average</b>	<b>Bad</b>
	29erXX					
	Arup Skiff					
	Aura					
	Rebel					
	Mackay FX					
	RS900					

# Women's Skiff and Mixed Multihull – Evaluation Process

## Appendix 2 – End of Evaluation Questionnaire – continued.

5	How safe is the boat? (e.g. in capsizes and personal injury)	Very safe	Safe	Average	Below average	Not safe
		29erXX				
		Arup Skiff				
		Aura				
		Rebel				
		Mackay FX RS900				
<i>Rating - please tick as appropriate</i>						
6	Overall how would you rate the boats?	Very good	Good	Average	Below average	Bad
		29erXX				
		Arup Skiff				
		Aura				
		Rebel				
		Mackay FX RS900				
<i>enter number 1,2 &amp; 3 with 1 being the top preference</i>						
7	Please state your top three boats in order of preference?	29erXX				
		Arup Skiff				
		Aura				
		Rebel				
		Mackay FX				
		RS900				
7	Any further comments?					