

Student Design Competition
Safe Affordable Ferries
2014

This is the second annual competition for safe affordable ferries for developing nations. In 2013 the Worldwide Ferry Safety Association made awards to student teams in the amount of \$10,000 with the top prize \$5000. An impressive roster of internationally recognized maritime professionals served as judges. The top awards were presented at the Society of Naval Architects and Marine Engineers Annual meeting with wide media reporting.

The Worldwide Ferry Safety Association has as its ultimate objective prevention of ferry fatalities in the developing world. One of the causes of fatalities is the lack of safe affordable ferries, which this competition seeks to address. We are seeking conceptual level designs for safe affordable ferries for developing country/emerging market nations. For 2014 the terms of reference are for a ferry that can carry passengers as well as freight (carried in light trucks) on an open water route for the Pacific Island nation of Papua New Guinea. Ideally the design would have applicability to other Pacific Island nations such as Kiribati, Vanuatu, and the Solomon Islands. Efforts will be advanced to get the winning design built.

Background

This competition has been initiated in response to the tragic record of ferry fatalities in parts of the developing world. To address this issue, IMO and Interferry have been working together on a ferry safety project, initially directly with Bangladesh as pilot nation. That experience together with IMO-organized Ferry Safety Information Sharing Forums in South East Asia and the Pacific Island nations indicated that one of the most difficult causes of ferry fatalities to address was the lack of safe affordable ferries, hence the rationale for this design competition.

Terms of Reference

This request is for responsive and innovative concepts for ferries prepared to basic design detail. For this year's completion the purpose of the ferry is to transport up to 200 passengers and ro-ro cargo between Lae and Kavieng via Kimbe and Rabaul in Papua New Guinea. The ferry must be safe to operate in the conditions of the waterway, the weather, and the required passenger capacity. The ferry must be affordable to construct, acquire, operate, maintain, and repair.

Parameters for the ferry

Route: Lae (350 NM) Kimbe (200 NM) Rabaul (200 NM) Kavieng and return (approx. distances).

Navigation: day and night travel.

Depth of water on route: no restrictions.

Depth of water dockside: some wharves may have draft restriction of 6 meters.

If alongside berthing, length of vessel should not exceed 50 meters.

Seasonality: Direction of wind NW and SE depending on seasons.
Wind speed: Up to 30 knots.
Sea characteristics: Swells up to 4-6 m height, and 4-5 m in length (near shore).
Number of passengers/trip: 150-200 with crew of 15.
All passenger compartments fitted with A/C.
Number of cabins: twenty of mixed configuration, 2 and 4 bunks each.
Seating: between 70 and 160 passengers (Premium and Economy class seating)
Toilets/showers (as appropriate under MLC 2006).
Shop/kiosk for groceries/soft drinks + storage for kiosk, shop.

Vehicle transport: Maximize number of vehicles.
Type of loading: bow or stern loading for passengers and vehicles, however, side loading for passengers would be acceptable.
Speed: 14-18 knots.
Crew space (7 cabins (4 x single bed, 2 double beds, 1 with 4 beds); galley, mess room, storage space; toilets/showers as required by International Conventions.
Holding tanks: retention tank with aeration; sludge and oily water retention tank
Fresh Water storage, Fuel Oil/bunkers storage capacities designed for 1000 NM.

Logistics of competition

Registration. Competitors must register as teams or individuals by email to ferrysafety@gmail.com between January 1, 2014 and April 1, 2014. To register, provide name and contact information (email and snail mail address and phone number) for the team captain, team members, their educational institution affiliations and the name and contact information for the faculty advisor. The team will be assigned a registration number.

Electronic submissions. Submissions to ferrysafety@gmail.com due by June 1, 2014.

Collaboration. Teams are encouraged to collaborate among disciplines and across national boundaries. For your information, a list of institutions that have received the Notice of the Design Competition may be accessed via the website (www.ferrysafety.org). Feel free to contact these or any other academic institutions.

Format. Submissions should have the following format:

Cover page: Registration Number, Title, Contact information for team captain, team members, and faculty advisor (Name, Institution, address, phones, email, website).
Page 2: one-page description of affordability and innovative features of the vessel design, construction, and/or operation, including major hull structural material and fabrication methods. Graphic representation of ferry.
Page 3: Table of contents,
Page 4 and beyond: Narrative, drawings and calculations, including cost estimates. (See "List of drawings and analyses").

List of drawings and analyses

Drawings and description of the vessel should reflect rudimentary design. The following drawings and analyses shall be submitted:

1. Table of ship's particulars
2. General arrangement of principal decks to individual compartment level
3. Outboard profile
4. Structural midship section with scantlings, including major scantling calculations
5. Lightship weight estimate, with calculations
6. Intact and damaged stability estimates, loaded, showing calculations
7. Speed-power estimates, loaded, showing calculations or other basis
8. Machinery arrangement plans and elevation
9. Machinery and hull equipment lists
10. Tank list, including fuel, ballast, fresh water, and sewage, with calculations.
11. Cost estimates. Relative not absolute costs are sought. Please consider the ship work breakdown structure (SWBS) six basic categories and provide parametric estimates for both labor hours and material costs by SWBS category. Categories are as follows:

SWBS 100	HULL Structure
SWBS 200	Propulsion MACHINERY
SWBS 300	ELECTRICAL Power
SWBS 400	COMM & COMM
SWBS 500	AUXILIARY Machinery & Systems
SWBS 600	OUTFIT

Important notes:

Submissions should be no more than 18 pages and no more than 9 MB. Font size should be no less than 12. Graphics that don't advance the concept should be omitted. Assumptions should be clearly stated. Rationale for design decisions should be explained. Appendices may be added in support of design decisions.

Evaluation

All submissions are to be evaluated by judges, based on the following criteria:

- Affordability and cost analysis
- Responsiveness
- Inventiveness
- Design approach developed at a conceptual level
- Opportunities for implementation
- An appreciation of limited repair facilities available in the region and consideration for easy maintenance

All submissions are non-returnable. Decisions regarding finalists and winners are at the discretion of the judges and the Worldwide Ferry Safety Association. Worldwide Ferry Safety Association retains the right to use any and all submitted work for

press, publication, and exhibition purposes. Copyright to the work is retained by the original author teams, but teams must agree to license their design concepts for a one time use for a nominal fee of \$500. Royalty arrangements can be negotiated if concepts are used to construct more than one vessel.

Awards will be made directly to the team captain for the team through wire transfer. The award for first prize is \$5000; second prize \$3000 and there will be up to three third prizes of \$1000 each.

The Worldwide Ferry Safety Association, a Delaware-registered not-for-profit corporation, is sponsoring the competition. WFSA is an outgrowth of Interferry and works closely with Interferry in its collaboration with IMO and other agencies.