Study on conversion of Traditional Wooden boat to Steel boat @ NINI,Patna

Y.Sudheer, Scientist-B
N.Ananth Kumar, PTA
Indian Maritime University-Visakhapatnam

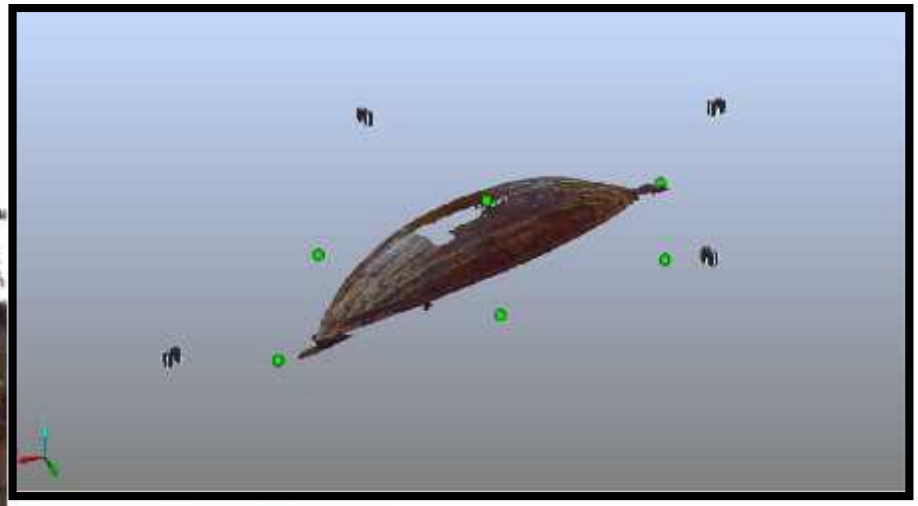
INTRODUCTION

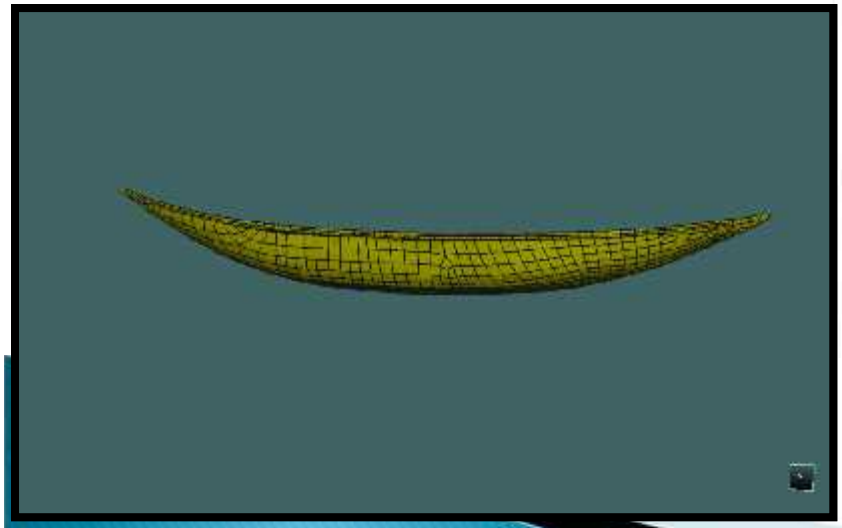
- Traditional boat building is strongly backed by the basic knowledge of craftsmanship of local carpenters and his knowledge has been passed from father to son. Most of the traditional boats are built in temporary yards and sheds erected by the carpenters wherever they found suitable place for construction of a boat mostly close to banks of the river.
- Various areas where Traditional Boats are generally used for are,
- Fishing.
- Small Cargo Handling.
- Passenger carriers in rivers and channels.
- Tourism etc.

Work @ IMU(V)

- Visited various boat building and operating sites in Andhra Pradesh, Odisha, Assam, West Bengal, Kerala, Gujarat, Maharashtra, Karnataka & Goa for conducting studies on areas of operation, purpose of operation (fishing/cargo/passengers),details of boat builders/operators, construction procedure, material of construction, safety & operating sites (maintenance, repair, fuel oil, personnel).
- Using Faro Focus 3D Laser Scanner country crafts are being scanned to obtain the hull geometry.

Process of hull form generation





- Generated offsets & Lines Plan for different hull forms from places visited.
- Weight Estimations.
- Study on Hull form characteristics: Hydrostatics, Intact Stability, Resistance etc.
- Based on the above study, the hull form(s) with better characteristics were selected and slightly modified to make them much more efficient and safe for navigation.

Figures showing Country crafts Extended Dugout canoe with outrigger(Goa),Padava (Visakhapatnam), Passenger Boat(Assam),Dinghy(West Bengal).

Advantages and disadvantages of Steel Compared to Wood

- **Advantages:-**
- Long life
- Easy construction
- Repair & maintenance can be done easily
- Safe in case of grounding

- **Disadvantages:-**
- More weight
- High initial investment

Case study on Wooden Fishing Trawler, Visakhapatnam,A.P.

Main Particulars of Fishing Trawler, Visakhapatnam,A.P:-

Length Overall	=16.10 m
Breadth	= 5.10 m
Depth	= 3.84 m

Stability comparision between Wood and Steel design

Full load condition	Wood	Steel	% Difference	Steel (Breadth Increase upto 0.4 m) *
LOA (m)	16.1	16.1		16.1
Beam (m)	5.1	5.1		5.5
Depth (m)	3.84	3.84		3.84
Draft (m)	1.88	2.152	14.47	2.053
Shell Thickness	1.25 inches	8 mm		8 mm
light ship weight	6.7	15.5	131.34	16.7
deadweight	48.6	48.6		48.6
Displacement (t)	55.3	64.1	15.91	65.3
LCG (m)	6.48	6.434		6.434
VCG (m)	1.58	1.574		1.574
GM (m)	1.523	1.306	14.25	1.585
max.GZ	1.18 m @ 65.9 deg	1.042 m @ 59.1 deg		1.134 m @ 56.8 deg
Deck edge immersion angle in deg	40.8	33.1	18.87	32.9 deg
Resistance (kN)	4.96	5.32	7.26	5.09
Speed in Knots	7.41	7.08		7.21

***In order to minimize the differences, The breadth is increased to 0.4mts. So that it would have equivalent stability to that of wood stability**

Thank you for your attention!

Y. Sudheer,
Scientist – B,
Indian Maritime University,
Visakhapatnam Campus,
Gandhigram,
Visakhapatnam 530005.
Email: sudheery@imu.co.in ; sudheer.y@nsdrc.res.in
Web: www.nsdrc.com ; www.imu.edu.in
Ph: 0891-2578360 (O), 08885522200