



Prof. S. NALLAYARASU
DEPARTMENT OF OCEAN ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY MADRAS,
CHENNAI – 600 036, INDIA.



Dr. S. Nallayarasu, Professor in the Department of Ocean Engineering, IIT Madras has a total of 22 years of experience in Oil and Gas industry, research and teaching. Prior to joining IITM, his industry experience includes analysis and design of offshore structures, port and harbour structures, subsea pipelines, lay barge facilities. During the tenure at Aker Singapore, he was involved in design of large topsides and jacket with lift, launch and float-over installations all around the world.

Currently he is working on research areas related to floating and fixed structures in deep water and investigation on hydrodynamic response of Spar and semi-submersible structures. He has published many research papers on fixed and floating structures. He is currently teaching subjects such as Design of Offshore Structures, Materials and Fabrication of Offshore Structures, Foundations for Offshore Structures and Installation of offshore Structures. He has been conducting training courses on offshore structural engineering, foundations and subsea pipelines for the industry including EIL, ONGC, SAIPEM, L&T, Technip, Aker Solutions and SHRDC Malaysia.

PERSONAL INFORMATION

Name	Prof. S. Nallayarasu
Position	Professor
Citizenship	Indian
DOB	20.04.1966
Field	Marine structures, Offshore platforms, Port and Harbours, Bored piles and diaphragm walls, Pipeline and installation design
Experience	22 years
Contact details	Tel : +91 44 2257 4819 & Fax : +91 44 2257 4802 M Emails : nallay@iitm.ac.in & dr_nallay@yahoo.co.in Web : http://www.oec.iitm.ac.in/prof_nallayarasu.html

EDUCATION

Degree	University/College/Institution	Year
Ph.D (Civil Engineering)	National University of Singapore	1994
M.Tech (Ocean Engineering)	Indian Institute of Technology Madras	1990
B.E (Civil Engineering)	Madurai Kamaraj University	1988
D.C.E	Tamilnadu Polytechnic, Madurai	1984

WORK EXPERIENCE

Position	Organisation	Duration
Professor	Department of Ocean Engg., IIT Madras	2012 – Till date
Associate Professor	Department of Ocean Engg., IIT Madras	2006 – 2012
Head, Offshore structures	Aker Solutions, Singapore	2002 – 2006
Lead Engineer	Aker Solutions, Singapore	1997 – 2002
Senior Engineer	Aker Solutions, Singapore	1994 – 1997
Engineer	Engineers India Limited, New Delhi	1990 - 1990



RECENT PROJECTS

➤ **Basic / Detailed Engineering**

- BCPA3 Process platform Project for ONGC
- Independent analysis of OFON-3 and 5 Platforms for Shell Nigeria
- Detailed Design of Fabrication Yard at Hazar Port, Turkmenistan
- Detailed Design of Coal Berth No. 3 for Ennore Port
- Sulphur Loading facility at Kuwait Al Ahmadi Harbour
- TGT Subsea Jacket for riser, Vietnam
- Pre-bid design for C - Series Phase 2 and B-173A-B well platforms Project
- Detailed design of berthing facilities for barge mounted power plant at Kakkinada
- Detailed design of pipelay stinger for Leighton Contractors Singapore
- Detailed design of fishing harbor at Mangalore and Malpe.
- Structural design of P2, P5 and C2 module for Cendor FPSO Project
- Detailed design of jetty head structures at DAHEJ LNG TERMINAL.
- Marine Terminal Facility at Cuddalore for Sanmar Chemplast.

➤ **Design Review Projects**

- Design review of B193 process platform for ONGC.
- Design review of MHN process platform for ONGC.
- Feasibility study for cargo handling terminal at Raswa canal Port Egypt for Sanmar Engineering Services.
- Structural Design review of 220 MW barge mounted power plant for GMR.
- Consultancy services for Ennore Container terminal.

➤ **Feasibility Study Projects**

- Revalidation of Metocean study for FSRU
- Preliminary design of Jetty for aromatics plant at Singapore for ESSAR.
- Mega Container Terminal Project at Chennai Port
- Ro- Ro Ferry Terminal at Gogha and Dahej for Afcons.
- SPM and Submarine pipeline project for NOCL, Cuddalore
- Preliminary Design of Coal Terminal at Wandh, Mundra Port, Gujarat for Afcons.
- Preliminary Design of Jetty at Arzew Bay, Oran, Algeria for Afcons.
- New Jetty facility at Qatar petroleum for Afcons.

➤ **Past Projects**

Total of 100 projects has been executed in the last 7 years. For details refer to personal website http://www.oec.iitm.ac.in/prof_nallayarasu_ConsultancyProjects.html



PAST PROJECTS

➤ **Jetties, Marine Terminal and Onshore pipelines**

- Marine Oil Terminals J1, J2 and J3 for Mumbai Port Trust
- Twin VLCC Jetties for JTC, Singapore
- Sihanoukville Terminal Cambodia
- Caltex Jetties 1, and 4 Singapore
- ESSO Jetties 1, 2 and 4 Singapore
- Petchburi Jetty Terminal, Thailand

➤ **Offshore Platforms, Pipelines and Risers**

- Heera redevelopment Project (HI, HJ, HSC and B134A) for ONGC
- Al Shaheen Field Development Project – Platforms HA/IA/HB Platforms
- Yetagun B Production Platform in Bay of Bengal, Myanmar for Premier Petroleum
- Al Shaheen Field Development Project – Platforms BA/CA, Offshore Qatar for Maerk Oil
- AMDP-30 Platform, Offshore Brunei for Shell
- HZ19-2/3 Platforms, South China Sea, for CACT-OG
- Panyu 4-2/5-1 Wellhead Platforms in South China Sea, for Devon Energy
- Al Shaheen Field Development Project, Block 5 2001- 3 Wellhead Platforms for Maersk Oil
- Hazira Drilling Platform, Gulf of Cambay, Gujarat for Niko Resources, India
- UAQ/ZORA Wellhead Platforms Atlantis / Crescent Petroleum, U.A.E.
- Rongdoi Field Development Vietnam – PUQC / WHD platforms

➤ **Pipeline and Pipelay Stingers Project**

- Pipelay Stinger for HHI Barge Regina-250
- Pipelay Stinger for HHI Barge HD-1000
- Pipelay Stinger for IOEC Barge AB1200
- Pipelay Stinger for Britoil Barge LB-1

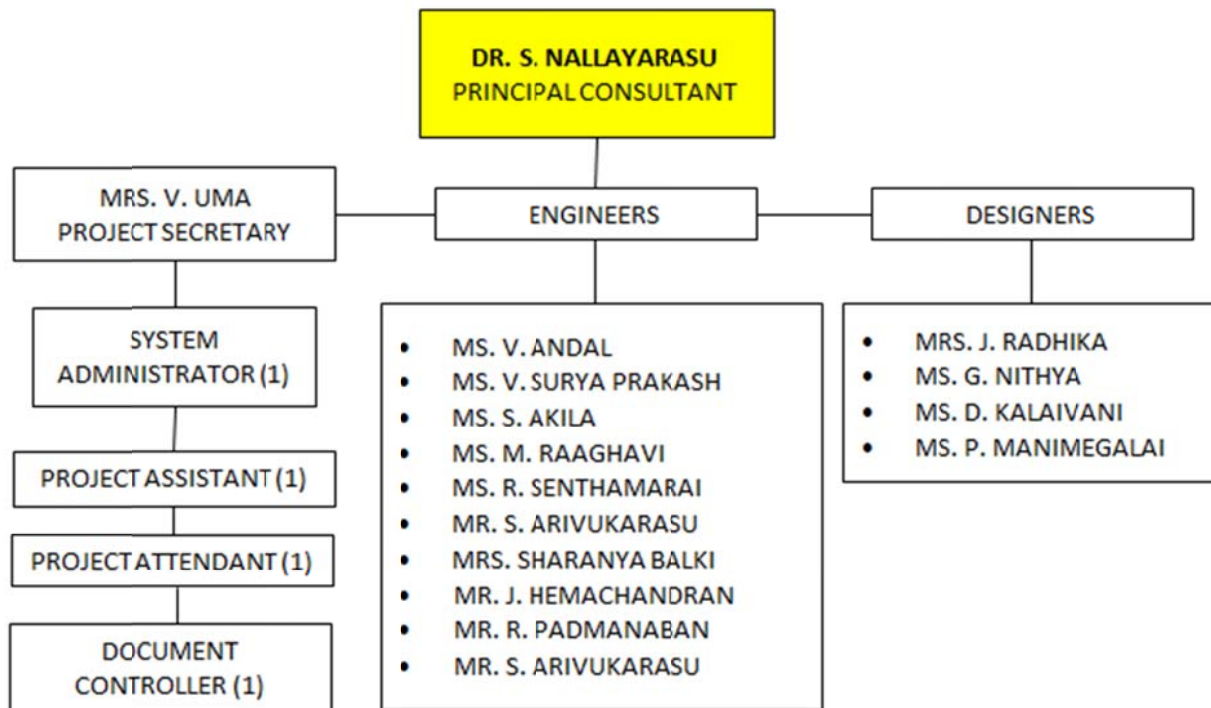
➤ **Onshore Plants and Pipelines**

- Trans Java Gas Pipeline Terminal, Indonesia
- Bundle Pipelines Project, Mumbai Port Trust
- Lankawi Water Supply Project



ORGANISATION CHART

Under the guidance of Dr. S. Nallayarasu following personal involved in feasibility study, detail design and review of marine terminals and offshore platforms.



CAPABILITY STATEMENT

The project team at our Department includes experienced consultants including marine works, hydrodynamic group have carried out many projects in east and west coast. The consultancy services include the following.

- ✓ Conceptual studies
- ✓ Feasibility Studies
- ✓ Detailed Project Reports
- ✓ Environmental Impact Assessment Reports
- ✓ Detailed Design of marine facilities
- ✓ Tender Document Preparation
- ✓ Assessment of Bids and Construction Review
- ✓ Design review
- ✓ Vetting of Design



PROJECT ENGINEERS AND ASSISTANTS

In addition to the consultants, our design group has following personnel to assist the consultants in design related activities for projects.

- Senior Offshore Structural Engineers (3)
- Structural Engineers (7)
- Project Administrative Staff (1)
- Designers (4)
- System Administrator (1)
- Project Attendant (1)
- Document Controller (1)

Further, as required by the project needs, project persons can be recruited for specific projects.

SOFTWARE AND HARDWARE

The project team is equipped with latest computer hardware and software. Total of about 10 Desktop computers and 10 Laptops is available for use by the project group. Following software is available for use.

- ✓ STAAD Pro (Structural Analysis)
- ✓ SACS (Structural analysis)
- ✓ OPTIMOOR (Mooring analysis)
- ✓ GRLWEAP (Pile driveability analysis software)
- ✓ SPW 9.11 (Sheet pile wall design)
- ✓ ALL PILE (Foundation Analysis)
- ✓ STRAND 7 (FEM Analysis)
- ✓ SLOPE/W (Slope Stability Analysis)
- ✓ Mathcad (Spreadsheet calculations)
- ✓ RC Design Spread sheets to IS Codes, API And AISC codes

All the computers are connected by high speed LAN network provided by the institute. 16 TB server based hard disk with RAID 5 backup is provided for the design group for storage and maintenance of project information.



RECENT PUBLICATIONS

➤ **International Journals**

- **Nallayarasu S.** and Saravana Priya S., Experimental and numerical investigation on hydrodynamic response of spar with wind turbine under regular waves (Part I), International journal of ocean and climate systems, Multi-Science Publications, UK., Accepted for publication.
- **Nallayarasu S.** and Saravana Priya S., Experimental and numerical investigation on hydrodynamic response of spar with wind turbine under random waves (Part II), International journal of ocean and climate systems, Multi-Science Publications, UK., Accepted for publication.
- **S.Nallayarasu** and Kirti Bairathi, Hydrodynamic response of spar hulls with heave damping plate using simplified approach, Ships and Offshore Structures, Available online from 11th Oct 2013.
- Nimmy Thankom Philip, **S.Nallayarasu** & S.K.Bhattacharyya, Experimental investigation and CFD simulation of heave damping effects due to circular plates attached to spar hull, Ships and Offshore Structures, Available online from 2nd Oct 2013.
- **Nallayarasu S.**, R. Sreeraj and M Manusha, Effect of Hull Geometry on the Hydrodynamic Response of Spar in Regular Waves, Special Issue on Coupled Dynamic Analysis of Floating Structures with Concept Technologies : Current Status and Emerging Future Trends Ships and Offshore Structures, Invited article, Available online from July 2012.
- Gopu R Sekhar and **S. Nallayarasu**, Experimental Investigation of Wave Slam and Slap coefficients for array of non-circular section of offshore platforms, Ships and Offshore Structures, Available online from 21st March 2012.
- K. Muthuchelvi Thangam and **S. Nallayarasu**, Hydrodynamic response characteristic of Non-circular spar hulls, Journal of Ship Technology, July 2010, Vol. 6, No. 2.
- **S. Nallayarasu**, S. Goswami, J. S. Manral and R. M. Kotresh, Spectral Fatigue Analysis of Jacket Structures in Mumbai High Field, International Journal of Oceanic and Climates Systems, International Journal of Ocean and Climate System, September 2010, Volume 1, Number 3 & 4.
- **S. Nallayarasu** and P. Sivaprasad, Hydrodynamic response of spar and semi-submersible inter-linked by rigid yoke under regular waves – Part I, Ship and Offshore Structures, Available online from 27th June 2011, 1–13.
- **S. Nallayarasu** and P. Sivaprasad, Hydrodynamic response of spar and semi-submersible inter-linked by rigid yoke under random waves – Part II, Ship and Offshore Structures, Available online from 27th June 2011, 1–9.
- **Nallayarasu S.**, Cheong H. F. and Shankar N. J. (1994) Wave induced dynamic pressures and forces on a submerged inclined plate. International Journal of Finite Elements in Analysis and Design, Vol. 18, pp. 289-299.
- Shankar N. J., Cheong H. F. and **Nallayarasu S.**, (1994) Application of Direct Boundary Integration Method (DBIM) to Wave Diffraction by submerged Bodies. Communications in Numerical Methods in Engineering, Vol. 10, pp. 799-808.
- **Nallayarasu S.**, Cheong H. F. and Shankar N. J. (1995) Estimation of incident and reflected waves in regular wave experiments. Journal of Ocean Engineering, Vol. 22, No. 1, pp. 77-86.



- Cheong H. F., Shankar N. J. and **Nallayarasu S.** (1996) Analysis of submerged Platform Breakwaters by Eigen function method, Journal of Ocean Engineering, Vol. 23, No. 8, pp. 649-666.

➤ **Conference Proceedings**

- S. Nallayarasu, Offshore Wind Energy – Indian Perspective, Presented at Indo-French Technology Meet, New Delhi, 2013.
- Nallayarasu S., Bhattacharya S. K. and Nimmy Thankom Philip, Damping Characteristics of heave plates attached to spar hull, Presented in Offshore Mechanics and Arctic Engineering Conf., 2012.
- Nallayarasu S, and Sudhakar S, 'Influence of Heave Plate on Hydrodynamic Response of Spar', Proc. of Offshore Mechanics and Arctic Engineering Conf., 2011.
- Nallayarasu S, and Gopu R. Sekhar and Wave slam/slap loads on structural members in the air gap, Proc. of Offshore Mechanics and Arctic Engineering Conf., 2011.
- Nallayarasu S, Battacharya S. K and Nimmy Thankom Philip, CFD Simulation of Flow around Damping Elements for Floating Bodies in Waves, ICMCFD, IIT Madras, 2011.
- Nallayarasu S, Muthuchelvi K, Hydrodynamic Behaviour of Circular and Non Circular Spar Structures – International Conference in Ocean Engineering, IIT Madras, 2009.
- Nallayarasu, S. Goswami, J.S. Manral and R.M. Kotresh, Validation of Spectral Fatigue Analysis of Jacket Structures in Mumbai High Field, International Conference in Ocean Engineering, IIT Madras, 2009.
- Nallayarasu S, Sivaprasad P., Coupled Dynamics of Spar and semisubmersible connected By a Rigid Yoke, International Conference in Ocean Engineering, IIT Madras 2009.
- Nallayarasu S, Sivaprasad P., Weather waning floating structures, International seminar on "Challenges in deep water structures, IIT Madras, Dec 2008.
- T.Radhakrishnan and Nallayarasu S., Numerical and experimental investigation on submerged horizontal double plate breakwater 7th International Conference on Coastal and Port Engineering in Developing Countries COPEDEC-VII 2008 in Dubai, UAE.
- Nallayarasu S and Pradeep Kumar D, Static Strength of Internal Ring Stiffened Tubular 'T' Joints, Proceedings of International Maritime – Port Technology and Development Conference, Singapore, MTECH 2007.
- S. Nallayarasu, Cheong H.F. and N.J. Shankar, Flow Visualization Studies around a Submerged Horizontal Plate in Regular Waves Conducted at 15th Congress of APD-IAHR on August 7 – 10, IIT Madras, 2006.
- Nallayarasu S., Cheong H.F. and Shankar N.J. (1992) Wave induced dynamic pressures and forces on a submerged inclined plate by Finite Element Method, Proceeding of International Conference on Computational Methods in Engineering (ICCME), Vol. 1, p. 113-118.
- Shankar N. J., Cheong H.F. and Nallayarasu S., (1993) Numerical simulation of waves with a fixed horizontal plate. Proceedings of International conference on Computational Mechanics, Vol. 2, p 1189-1194.



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- Shankar N. J., Cheong H.F. and Nallayarasu S., (1993) Interaction of waves with submerged objects by Direct Boundary Integration Technique. Presented at PACON 93 Regional Symposium - Beijing, China, June 14-18, 1993.
 - Shankar N. J., Cheong H.F. and **Nallayarasu S.**, (1994) Investigation of Particle Kinematics around a submerged horizontal plate by Particle Image Velocimetry (PIV). Presented at IAHR - Singapore, 24-26 August, 1994.
 - Cheong H.F. Shankar N. J. and **Nallayarasu S.**, (1994) A Simplified Analytical Model for Submerged horizontal plate breakwater, presented at IAHR -Singapore, 24-26 August, 1994.
 - Deepening of Existing Berth in North Arm Inner Harbour at Visakhapatnam Port Trust Prof. R. Sundaravadivelu, **Dr. S. Nallayarasu**, Mr. K. Ramachandran Rao, and Mr. A. Ramasubramaniyan, Port of Chennai celebrates 125 years of maritime service to the nation on 18-20th January 2007, University of Madras, Chennai.



Workshops and Conferences Conducted

No	Name of the course	Year
1.	Workshop on Development in Deep Water Technology	2008
2.	International Conference in Ocean Engineering	2009
3.	Workshop on Developments in Offshore Engineering	2010

Short term courses conducted through Continuing Education Programme

As per the request from industry and academic institutions, several training programs have been conducted to enhance the manpower and skills in the field of “Offshore Structural Engineering”.

No	Name of the course	Sponsoring Agency	Year
1.	Analysis and Design of Offshore Structures	Saipem India Project Services Limited, Chennai	2006
2.	Analysis and Design of Offshore Structures	Saipem India Project Services Limited, Chennai	2007
3.	Analysis and Design of offshore structures	S.B. Marine, Kolkata	2007
4.	Offshore Structures	Engineers India Bhawan, New Delhi	2008
5.	Offshore Structures	Larsen & Toubro Limited, Mumbai	2008
6.	Offshore Structures and Pipeline Engineering	L & T Valdel, Bangalore	2008
7.	Analysis and Design of Subsea Pipelines	Larsen & Toubro Limited, Mumbai	2008
8.	Offshore Structural Engineering	L & T Valdel, Bangalore	2008
9.	Subsea Engineering	Tata Consultancy Services, Chennai	2010
10.	Offshore Structural Engineering	Engineers from the industry	2011
11.	Offshore structural Engineering for FPSO	Technip India, Chennai	2011
12.	Foundation Engineering for Offshore and Coastal Structures	Engineers from the industry	2012
13.	Offshore Structural Engineering	Selangor Human Resources Development Centre	2012
14.	Analysis of Offshore Structures	Aker Solutions, Malaysia	2012
15.	Advances in Fatigue analysis of Offshore Structures	Engineers from the industry	2012
16.	Analysis of Offshore Structures	Aker Solutions, Malaysia	2013
17.	Analysis and Design of offshore platform structures	Larsen & Toubro Limited, Mumbai	2013
18.	Analysis offshore structures using SACS	L&T Valdel, Bangalore	2013