Rajakumar Dhanabalan
Principal Structural Engineer
Civil / Structural / Marine Design

Summary

Years of Experience

30+

Industries

- Oil and Gas
- Power
- Marine

Types of Facilities

- Onshore Oil and gas facilities
- Offshore Oil and gas Production Platforms
- Thermal and HRSG Power plants

Areas of Expertise

- FEED and Detailed design of Onshore oil and gas plants including refineries, gas to liquids and LNG gasification facilities
- Detailed design and construction of jacket and topsides structures
- Design and supervision of onshore installations
- Detailed design of structures for thermal and HRSG power plants
- Detailed design of residential reinforced concrete structures.

Qualifications

Education

BEng Civil Engineering (1985) – Alagappa Chettiar College of Engineering and Technology – Tamil Nadu, India

MEng Structural Engineering (1995) – Reginal Engineering College Tamil Nadu, India

Registrations / Certifications / Licenses

Member of the Institute of Marine Engineering Science and Technology (MIMarEST)

Software / Skills

SACS, USFOS

ASAS

STAAD

Mat3D, TEDDS

Experience

Principal Structural Engineer

May ‘25-Present)

Performed detailed analysis of the inlet heater hookup module for the Kalalan FPSO.

Principal Structural Engineer

(Nov ‘25-Mar ‘25)

Responsible for the jacket integrity (pushover and redundancy analysis for K12-BP and K12-BD platforms) using USFOS, for ENI Energy Netherlands B.V. Involved in the Jacket Risk Based Inspection report for the above Jackets located in the Dutch continental shelf of the North Sea.

Principal Structural Engineer

FEED for RougH2 hydrogen storage, QE MM and BH Field life extension- FEED and Pre- FEED, Karabakh – Topsides feasibility study and FEED for Crude and Bitumen Unit, KOC Kuwait.

(Mar ‘19-Feb ‘25)

Responsible for the FEED design of jackets, Topsides, and bridges for the RougH2 Jacket and Topsides, QP, BH and MM field redevelopment. Analysis includes in-place, seismic, fatigue, pushover, boat impact, Lauch, and post launch for the new float over and brown-

field jackets and prop jacket. Also familiar with pile driving fatigue assessment in GRLWEAP.
QP MM Pre-FEED:(Dec' 19-Dec '21)
Responsible for the PRE-FEED and relocation concept design of jackets, Topsides and bridges for the QP, BH and MM field redevelopment.

Principal Structural Engineer

East Cendor Topsides FEED and Morray West (UK) offshore wind farm – Concept design

(Sep '18 – Mar '19)

Responsible for the FEED design of normally unmanned topside (600 Te) for East Cendor development in Malaysia. Completed weight report, inplace, transport and lift analysis and prepared design report for the completion of FEED.

Responsible for the concept design of normally unmanned topside (2000 Te) and Jacket (1800 Te) for Moray West offshore wind form development in North Sea. Completed in-place, lift and Transportation analysis for Jacket and topside analysis for temporary conditions.

Principal Structural Engineer

SABIC Teesside Gas Cracking project - FEED and TCO, Future Growth Project RIE's - Detailed Design, Kazakhstan

(Aug '17 – Sep '18)

Responsible for the design of pile foundation for the hydrocarbon splitter column and foundations for the equipment structure, using MAT3D foundation design software. Also responsible for the structural design of equipment structure supporting splitter drum and reboiler for the client SABIC at Wilton, Teesside Gas Cracking Project, Phase2-(FEED).

Responsible for the design of Remote Instrument enclosure modules for the Tengizchevroil project in Kazakhstan. The Remote Instrument control room modules are based on stressed skin design and designed to withstand the loads during permanent and temporary conditions (transportation and installation). The modules were code checked to AISC requirements.

Civil Engineer

Freelance Estimation for House Extensions

(Dec '15 – Aug '17)

Estimation and consultancy service for small house extensions. Using the Estimation Express software package quotations are prepared along with price and time schedule to assist the builder bid for the work. In addition, reports generated using the data assist to monitor supply chain management and to ensure timely availability of materials at site.

Principal Structural Engineer

SMOE / Det Norske, Ivar Aasen Detailed Design, Norway

(Mar '14 – Jul '15)

Responsible for the design and detailing of equipment supports for Deaerator, Inlet and Test Separators, Flare KO Drum, pumps and process equipment and temporary generator modules, using Norsok, European and DNV standards

I completed detail design of blast wall connections to the structure and was also responsible for the interface management with the blast and fire wall vendor. I also designed the structural blast wall for the pipe rack crossing the vendor blast wall. I completed the hook up supports for the Caissons, which reduced significant offshore work by installing the caissons onshore and very little work offshore needed to align the caisson supports with the installed caissons in jacket. I also reviewed the crane pedestal and connections for fatigue and serviceability condition.
I carried out in-place and tow fatigue analysis of process extension module, M40 using SACS software, to assess the in-place and transport fatigue damage during sea transportation and in-place conditions. To assess the tow fatigue damage during transportation from the yard at Singapore to the installation site in North Sea, the structure was loaded with transportation forces during the tow duration of 40 days. The forces were derived from the response amplitude operators extracted from the motion response analysis. The damage induced on the joints due to wave forces in different sea routes were added by the program to assess the cumulative damage and the transportation fatigue results were reported in the report ' M40 – Tow fatigue analysis report'.

Principal Structural Engineer

Talisman MonArab Redevelopment Project – Jacket Detailed Design, North Sea

(Feb '13 – Feb '14)

Responsible for the design of Jacket appurtenances. I completed in-place, extreme and fatigue analysis of caissons with integrated jacket model and the design of utility and bundle caissons, J tubes and breakout spool support frames using SACS offshore structural analysis program. I also completed the detail design of supports and guides for caissons and J tubes including umbilical pull in analysis. I also designed pump retention bars for utility caissons with the principles of dropped object analysis in USFOS software program which is widely used for the progressive collapse analysis.

Also responsible for the detail design of sea access ladders, top of jacket walkway and miscellaneous jacket appurtenances for the above jacket. I attended weekly interface meetings and model reviews with the client 'Talisman Sinopec Energy limited' and with the topsides contractor CB&I, London to discuss the issues and report the progress of work related to the jacket appurtenances. I was also responsible for identifying the design change and to assist OGN in raising change orders for client approval.

Principal Structural Engineer

Talisman MonArab Redevelopment Project – Topsides Detailed Design , North Sea

(Jun '12 – Nov '12)

Responsible for Spectral fatigue analysis for the link bridge to the existing Montrose alpha platform using ASAS software program. I used the site specific wind spectra and created all the input loading files for ASAS program using the in house excel spreadsheets. Manually calculated stress concentration factors are added to the input file to use Efthymiou's parametric equations which were not available in the program. The analysis was rerun with increased chord thickness to improve the fatigue lives of the joints. The design requirement of 50 years for all the joints, which can be inspected during its design life, was met by improving the parameters of the joints. Also completed the fatigue life assessment of bridge pin with integrated Jacket, topside and bridge model using ASAS as well as the lift and transport analysis of Flare boom structure, including upending.

Principal Structural Engineer

Jasmine offshore field development project-Detailed Design, North Sea

(Mar '11 – May '12)

I was responsible for Part of the Primary steel analysis using SACS offshore structural analysis software for in place, seismic, blast, transport and lift cases for Wellhead platform and prepared Operational and Non-operational primary steel design reports.

I also checked the calculations for the spectral fatigue analysis of the link bridges to Wellhead, Riser and Living Quarters platforms and designed the critical pipe supports located on the bridges. I completed the design of Crane Pedestal for the three platforms and also addressed all the HAZOP actions related to the different scenarios of offshore lifting. I also completed the design report of the crane pedestal for the three platforms.

Principal Structural Engineer

Gorgon LNG Plant – Detailed Design, Australia

(Oct '09 – Feb '11)

I completed the dynamic analysis and I was responsible for providing dynamic stiffness data of the steel foundations, which was the basis of foundation stiffness used in the design of motor and compressor. The design was verified by the compressor vendor, Mitsubishi heavy industries, Japan.
I also completed the analysis and detailed design for transportation of End flash gas compressor module. For the transportation analysis, STAAD offshore program was used to generate inertial loads due to transportation based on the module accelerations extracted from the motion response analysis.

Senior Civil & Structural Engineer

Gas Processing facility-FEED (GASCO, Abu Dhabi) and Kashagan Offshore Oil and Gas Development Project-Detailed Design, Kazakhastan

(Oct '07 – Oct '09)

I completed the front end design of an integrated gas development project for the gas processing facility at Abu Dhabi (Gasco) involving preliminary design and material estimate for Ruwais plant facilities.
I was responsible for the design of pipe rack and process modules for Kashagan Offshore oil and gas development facility including operating and blast condition, loadout, transport, skidding and lift analysis.

Senior Civil & Structural Engineer

Woodside Train 5-Detailed Design and Pluto LNG plant-FEED, Australia

(Apr '06 – Oct '07)

I was responsible for designing pre-assembled modules (Woodside Train 5) for the LNG plant in Australia
I completed the front end design and material estimation for the pre-assemblies of LNG train as well as the pipe racks and process modules for the Pluto LNG plant. I have also developed a VBA application to consolidate the project material take off from the extracted data from PDS.
I carried out detail design and material orders for the pre-assembled pipe racks and process modules with the design incorporating in-place, load out, transport and lift analysis.

Civil & Structural Engineer

Air Separation Unit-Detailed Design, Escravous, Nigeria

(Feb '06 – Apr '06)

I designed pre-assembled modules for Chevron Nigeria Ltd for the air separation unit at Escravous, Nigeria
I also completed the front end and process pipe rack module design for lift, load out and sea transportation. I have also designed compressor shelters and process pump skids.

Civil & Structural Engineer

Gas Storage Plant-Bid, Saltfleetby, UK and Gathering Centers-FEED, Kuwait

(Oct '05 – Feb '06)

I completed preparation for a comprehensive bid proposal for gas compression plants on behalf of Wingas at Saltfleetby.
I prepared detailed standards and specifications for construction activities as well as specifications for acoustic and blast relief compressor buildings. I also completed FEED, of a North Kuwait water injection facility for gathering centers.

Civil & Structural Engineer

LNG Importation Terminal-Detailed Design, Milford Haven, UK

(Nov '04 – Sep '05)

I was responsible for the conceptual and detailed design of LNG importation terminal at Milford Haven, South Wales.
I designed jetty head pipe support structures and jetty to shore pre-assembled modularised piping modules.
I prepared contract documents for preliminary site enabling works and also visited the site to support construction during the dismantling of existing oil import facilities at the jetty head structure.
I was leading the civil and structural design of control building and pipe route to fare (Pipe bridge) and pipe track sleeper foundations.

Civil & Structural Engineer

Air Separation Unit ORYX, Qatar and Yanbu, Saudi Arabia (SABIC) – Detailed Design

(May '04 – Oct '04)

I was responsible for design of Pipe rack for the gas to liquids projects in Qatar (ORYX) and Yanbu (SABIC-Saudi Arabia) and also designed foundations for compressors, pumps, heat exchangers, vessels, cooling water structures, pipe rack, compressor shelter structures and other pipe supports.

Civil & Structural Engineer

Boiler Supporting Structure(600MW) - Detailed Design, Wang Qu, China

(Apr '04 – May '04)

I completed initial analysis of boiler supporting structures at Wang Qu (660MW) in China.

Group Leader

Foster Wheeler, Chennai, India

(May '01 – Mar '04)

I was leading the steel, flues and ducts design for 4x325 MW gas power plants in Egypt, 120 MW power plant for SIPCO in the USA and 410-tph power plant for Sinopec in Zhuhai, China.
I also supervised the design and detailing of SCR for CPL and Mayor Power utility in the USA.

Civil & Structural Engineer (secondment), Reading, UK

I was responsible for the analysis and design of pre-engineered buildings and utility support structures (pipe rack) for oil and gas pipelines in DP73 project and blast resistant buildings.

Manager – Engineering, Mitsui Babcock Energy Limited, India

(Aug '00 – May '01)

I was responsible for detail design of 2x550 MW Taichung thermal power plants on behalf of Taiwan Power Company.

Principal Civil & Structural Engineer, India

Thermal Power Plant and HRSG Power Recovery Plants

(Aug '98 – Jul '00)

I completed initial analysis and subsequent design and detailing of 2x55 MW BFG power plants for ISPAT Energy Ltd. I was also responsible for the analysis, design and detailing of HRSG inlet duct for the HRSG power plants at GANTT, Griffith and Desert Basin in USA for NEM BV, Netherlands. I carried out the pre-bid engineering activities for a BTIP project for Buoyess Corporation, France.

Civil & Structural Engineer, India

(Aug '87 – Jul '98)

I was responsible for a number of projects during this time including the design of various industrial structures and buildings for compressors, DG and technological structures, boiler supporting structures, steel chimneys and water tanks.

Civil Engineer, India

(Aug '85 – Aug '87)

I was responsible for supervising the construction of the residential building projects with responsibility for the correct implementation of design drawings.

Professional History

- KBR (May-2025-Pressent)
- Rosenxt (11/2024-03/2025)
- Wood (03/2019 – 03/2025) (08/2017-09/2018) (03/2014-07/2015)
- Petrofac Engineering Services, UK (09/2018 – 03/2019)
- Freelance Civil Consultation (12/2015 – 08/2017)
- Sea and Land Project Consultants Ltd, UK (02/2013 – 02/2014)
- CB&I, London, UK (06/2012 – 11/2012)
- Worley Parsons, London, UK (03/2011 – 05/2012)
- MW Kellogg Limited, London, UK (10/2009 – 02/2011)
- Fluor Corporation, Camberley, UK (10/2007 – 10/2009)
- Foster Wheeler, Reading, UK (04/2006 – 10/2007) (05/2002 – 05/2003)

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- Air Products, Hersham, UK (02/2006 – 04/2006) (05/2004 – 10/2004)
- AMEC, Darlington, UK (10/2005 – 02/2006)
- Whessoe Oil and Gas Limited, UK (11/2004 – 09/2005)
- Mitsui Babcock, Crawley, UK (04/2004 – 05/2004)
- Foster Wheeler, Chennai, India (05/2001 – 03/2004)
- Mitsui Babcock, Chennai, India (08/2000 – 05/2001)
- Babcock-Borsig Idea Limited, Chennai, India (08/1998 – 07/2000)
- Esan Associates, Trichy, India (08/1987 – 07/1998)
- PA Construction, Chennai, India (08/1985 – 08/1987)