



Modern technology supports classic methods in engineering development

For over 30 years MAATS Tech have been recognised for providing quality, considerably designed equipment arrays for a plethora of vessels across a variety of capabilities. Core competencies are centred on dynamically positioned special purpose vessels for diverse operations in subsea construction, diving, cable laying and flexible pipe laying, for both new build and conversion projects. MAATS have been lucky enough to have a wealth of engineering experience at their disposal and continue to nurture this with a focus on employee development and mentoring across all departments.



Unfortunately, the perceived benefits of this type of software have not changed with limitations still on MRP and converting CAD models for FEA analysis.

Obviously, what we can do with the software now far surpasses what we used to do 40 years ago, but what needs questioning, is the excessive level of detail which is used today, this needs to be tempered with respect to the type of product being made. Top of the list should not be more detail, but less, with faster turnarounds; modern software lets us do that.'

Steve does highlight however that technology is no substitute for imagination, the most important tool in an engineer's arsenal. He notes that this is difficult to teach and technology is not something that can provide that intuition that naturally comes from experience.

These types of experiences should be handed down through mentoring of graduates and allowing young engineers to be fully immersed in the detail. MAATS Tech recognise the importance of this and have always nurtured the growth of their more junior engineers and provided training both internally and externally to make them much more proficient engineers.

When it comes to project work, the philosophy is to start projects early with the end client, alongside the design house to ensure that the client's operational needs are recognised and included through all the major design decisions. Then various design software platforms are used to be able to provide accurate and interactive designs which give the client clear vision of what their final product will look like and how it will function.

In 2009, MAATS brought FEA capability inhouse and with a dedicated internal FEA team they began to use specialist software

to further check the feasibility of their designs. With calculations to identify potential issues being so readily available, it meant design changes could be made much earlier in the design process and prior to manufacture. Some of their original products are still working in the industry today: 30 years on from their original design.

The FEA department work not only on internal projects, but also function as a consultancy. With the variety of software available, it allows for a wide variety of industry engineering analysis, from marine through to defence and aeronautical among others. By embracing the advances in available technologies, the multidisciplinary team have gained a host of experience and skills. Most recently the department has been able to offer dynamic marine analysis using OrcaFlex, meaning accurate and true to life product analysis.

Principal Analysis Engineer, Ben Murcott, is an advocate of the collaborative process of engineering and encouraging in depth calculations at the design phase to prevent costly impacts to the project. 'The key to a successful design project is collaboration between the designer and analysis engineer from start to finish. Often in industry, analysis is positioned at the end of the design process as the last port of call before manufacture. Like a gate keeper, it is used to identify oversights and issues which then brings cost, waste and impact on schedules. Such issues could have been avoided with more thorough application of classic engineering calculations and understanding of the full design requirement, prior to detailed draughting and analysis effort such as FEA.'

As, Steve Brown alluded to previously, Ben agrees that communication and experience are the foundation of any engineering process. 'Communication and the sharing of knowledge. Computer Aided Engineering tools have advanced but experience,

MAATS historically made their name consulting and designing equipment for the Oil and Gas industry but with a significant downturn of that sector in recent years, the demand for cable lay and array spread designs gave MAATS the opportunity to diversify and apply the years of industry experience to a relatively new and quickly growing arena.

In previous years engineering design has relied heavily on manual calculation and the experience of the engineer, or naval architect to 'know' if a design will be successful. Design draughting was a standard skill, pencil and paper stuff, requiring intricate and exacting manual calculations which was time consuming and meant design variations could be quite lengthy.

Chief Engineer at MAATS, Steve Brown, has gained extensive knowledge in engineering, having started his career as an engineer over 50 years ago. He comments on the differences in technology he has witnessed over his career.

'All degree courses then, 50 years ago, compared to now started in a machine shop making tools of all sorts, some of which I still use. Tools of the trade were drawing boards and bureau computers, on-line teleprinter terminals only and no screens. By the late '70's we started using 3D CAD.





expertise and teamwork are still the foundations of a successful project. Technology will continue to advance but how we communicate should continue to adapt and develop with it. To reinvent the wheel is the greatest mistake an engineer can make. Talk to others, take an interest in what has been done before. Only then are you equipped and ready to bring something new and useful to the world.'

At MAATS, part of an Analysis Engineers role is to consider all design loads and how they will be applied, referencing experience and previous similar projects. The earlier the analyst can support the designer in this activity, the better. When designs are passed to the analysis team for FEA, they are already mature or at the very least 'in the ballpark'.

In recent years, the improved FEA tools available in CAD packages have enabled designers to test designs themselves prior to them being passed on for detailed analysis by the Analysis team. Such efforts have yielded significant time and cost savings further down the project timeline, further advancing our processes.

The skills and experiences taken from MAATS track record of projects has recently supported them in winning two major cable lay equipment projects on newbuild vessels, Nexans Aurora and the Van Oord new green hybrid cable layer. By using knowledge gained from working with operators across the Energy industries and the close collaboration

with the clients and their vessel design houses early in the concept phase, ensures that the designs are always forward thinking, more efficient in both costs and time and have a clear operational function.

Drawing on the latest technology the company has carried out many engineering studies for its clients and these studies can then be used to progress the design forward to prove the concept for the client prior to major investment and later support the

development of detailed engineering and manufacturing of the equipment.

Continuing to review how to advance further in knowledge, skills and progress as the drive to change how energy is harnessed across the sectors and being involved with groundbreaking projects with companies, such as Nexans and Van Oord, is essential to the innovation and quality processes that MAATS prides itself on.

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