Standardising specifications: a new approach

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In any large project in the oil and gas industry, the preparatory work that goes on at infrastructure design stage can often become a significant resource sink. The specifying of components, be it pipelines, flanges, valves or other ancillary equipment, can drag on in an iterative and often inefficient process that distorts initial cost and revenue projections.

As the sector continues its efforts to reduce costs and improve efficiency while maintaining the necessary high infrastructure and operations standards, traditional methodologies may no longer be in the best interests of operators and asset owners. This is especially true for smaller or newer market participants who themselves do not match a traditional industry profile.

Streamlining and optimising this engineering design supply chain has proved to be an area in which efficiencies can be made to the benefit of the overall project.

## The documentation process

The development of standard specifications for individual components, infrastructure or operational activity is a multi-stage process. The starting baseline is the standards set by organisations, such as the International Organisation for Standardisation (ISO); Det Norske Veritas Germanischer Lloyd (DNV GL) and the American Petroleum Institute (API), amongst others.

To cover all eventualities and all purposes, these base codes are generic by design and intent. They are typically reviewed and updated every five years to ensure they remain relevant, so over-specification would render them obsolete almost at the point of publication. More frequent updates and publication schedules would create constant upheaval for the industry. Furthermore, the requirements of a rig off the coast of Australia, for example, are inevitably different for those in West Africa or the North Sea. A base code, by definition, cannot cover all potential requirements.

The downside of these deliberately broad standards is that they can, and do, often overlap and contradict each other, and they don’t necessarily fully reflect current best practice. Consequently, oil majors often develop their own suite of standards specifications that are significantly more onerous than those of international bodies. This set of documentation is informed not just by the standards set by the relevant bodies, but by the accumulated experience and knowledge of the specification writers and engineers.

Navigating through this patchwork of standards, requirements, codes and experience almost inevitably leads to a bespoke design pack of materials and specifications for each new project. Clarifying and adding data and details to points of the base code for an auto-injection line for an offshore platform off the coast of Angola, for example, can be a laborious and lengthy process.

At this point, documentation encounters reality in the form of equipment manufacturers and fabricators, installation contractors, operators, vendors, and other key parties in the supply chain. Because experience in the field moves slightly faster than the ability to record it, even documentation of the highest quality will be subject to clarifications, amendments and even re-writes from these organisations – who bring their own experience and requirements to the process. The tendering and bid qualifications stage is therefore characterised by extensive design packages being sent out and returned with technical queries and clarifications until agreement and compliance is achieved.

For example, consider the following:

**1. Carbon steel line-pipe specifications.** The supplier advises project planners to extend the steel manufacturing technique from the current method of basic oxygen or electric arc furnace primary melting, plus vacuum oxygen degassing. The proposed changes involve adding an alternative process: a modern combination of direct reduced iron in the electric-arc furnace that enables the production of fully aluminium-killed, argon-stirred, calcium-treated, clean steel. The end result is a pipe mill that can produce steel using more cost-efficient approaches.

**2. Flange specifications.** In this case, suppliers advise that as hydrostatic testing is typically carried out by the pipeline fabricator, flange mill provision is very expensive and should be avoided. They propose design calculations that can prove hydrostatic test capability, which would make the process more cost efficient.

In both instances, essential information from suppliers makes a significant difference to the cost and efficiency of the proposed project and the earlier that data is made available, the greater the advantage it delivers.

As most projects require a series of specification documentation suites, with feedback from various third parties, this stage can cause serious delays to new projects and add costly rig-time to maintenance work on existing infrastructure. The necessary observation and recording of standards can lead to expensive delays. For smaller operators and new market entrants, that don’t have their own in-house specifications, the costs for a tie back or small modification are disproportionately large.

## Early engagement with third parties

At Wood we have created a set of standardised specifications that incorporate and rationalise the best aspects of the base codes and operator specifications. We then inject our own experience and best practice to produce design packs that are effectively off the shelf but still customer- specific. By putting all the necessary time and investment up front into design packs that could be modified to accommodate particular operational quirks, the need to reinvent the wheel each time is substantially reduced, as well as the price of the design package.

However, we also wanted to secure the engagement of the wider supply chain. So a key aspect of the development of standardised specifications is the earlier, closer collaboration and consultation between our internal engineers, who are creating the specifications and design packs, and the original component manufacturers, fabrication and installation experts. Early-stage collaboration with third parties ensures that:

* The greater part of the design requirements have already been given the green-light by manufacturers
* The documented requirements can be delivered in practice
* The requirements are optimised in terms of their constructability
* The final implementation meets code compliance and integrity requirements

The key to this approach is a rolling programme of continual engagement and improvement. When Wood specifications and data sheets are used, relevant discipline engineers are involved in their creation and review – alongside experts from third parties. Once completed and used on the initial project, any changes, improvements, customers’ comments and lessons learned are incorporated into the specifications for use on future projects.

At the same time, Wood’s team stay in contact with third parties to capture any innovations and improvements to equipment and component, whether based on R&D activities or practical experience in the field.

In this way, the documentation becomes a more dynamic and responsive source of vital information. It creates a virtual circle of improvement, by which the collective pool of industry knowledge continues to expand. Finally, this approach saves on engineering design costs, avoids unnecessarily or onerous requirements, and ensures a level of consistency to projects globally.

## Collaborative specifications in practice

The approach that Wood has developed has already started to deliver positive results for the company’s customer base. For example:

* In the UK, specifications were required for a 47km gas line pipe. The operator provided its own go-buys for specifications for materials, welding, coating, insulation and fabrication. Working together, Wood and the operator agreed to use Wood’s standard specifications because of the improved technical constraints that they offered
* In the Middle East, Wood was asked to provide a single standard specification for welding and non-destructive testing (NDT) in support of a major project. However, after reviewing the relevant design documentation Wood identified additional specifications required to ensure the quality and integrity of the scope. Through detailed dialog with the customer it was agreed that due to the complexity of the scope, further specifications would be required to support the many components and their varying welding and testing standards. Wood delivered a complete suite of documents covering specifications for manufacturing components, coatings, fabrication and testing
* In Europe, a fast-track project required a suite of specifications to be written in a very short timeframe. Wood’s standard specifications suite was sufficiently detailed and up-to-date and could be rapidly tailored to meet the project’s requirements and its strict deadlines

In each case, collaboration with third parties leads to clear and concise ready to use documents which create a better level of understanding between contractor and the third parties it works with. They create a framework in which lead times for future projects can be shortened as technical queries or deviations are resolved with third parties at an earlier stage.

## Conclusion

Wood’s global customers continue to benefit from high-quality standardised documents generated in collaboration with third parties that are both pragmatic and practical. They are based on extensive experience of Wood’s engineers and the tried and tested techniques they deploy, to build efficiency coupled with the highest standards to individual projects.

However, the benefits extend beyond the completion of the immediate project: the additional input from third parties and commitment to continual improvement is a positive step for the industry as a whole.

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