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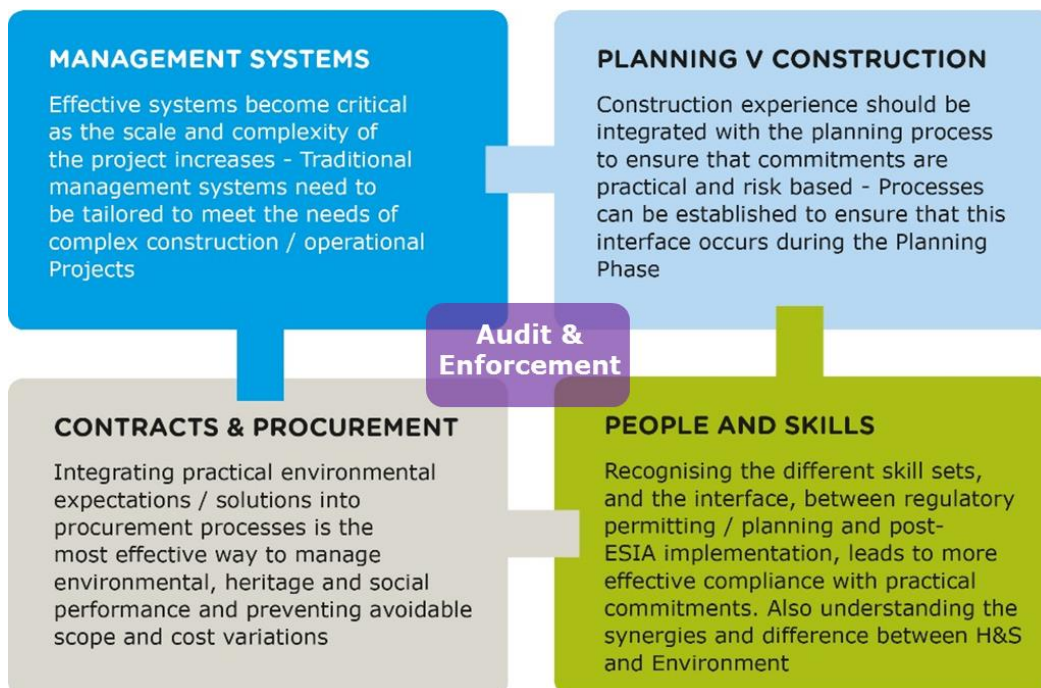
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**Title of Paper: Improved Compliance through Effective**

Nick Houldsworth shares a few of the lessons learned from developing, managing and implementing environmental compliance requirements for the delivery of major projects.

In summary, the key success factors include: ensuring that environmental compliance has been considered early in project delivery and has been effectively included in project procurement and contract processes; the environment and approvals function is comprehensively integrated with the broader project team; construction experience informs the planning and approvals phase; effective management systems are applied; and effective oversight by the Regulator occurs.

**Figure 1: Summary of key compliance success factors**



A more detailed overview of the key lessons learned, and recommendations are presented below:

**Interface between Project Approvals and Practical Construction Experience**

As part of an approvals process, a typical response to a potential impact can be for a management plan to be prepared and imposed as a condition of approval. However, these management plans can be impractical because the impact is simply not manageable in the manner specified in the approvals-focussed management plan.

A key challenge faced by project teams in construction is being handed environmental obligations that are difficult to implement from a constructability perspective. This is often because the focus in the pre-construction phase has been on securing approvals – “at any cost”. In these instances, the proposed

mitigations have not been developed and/or reviewed by people with practical, risk and site-based construction and operational management experience.

An associated challenge with the approvals professionals transitioning into the Construction Environment Manager role is that the Environmental Management Plans (EMP's) developed in the approvals process often become the execution document. However, the approvals related EMP is designed to demonstrate to the Regulator how environmental impacts will be managed and is not a practical execution document. Instead, the obligations and commitments should be transferred into a practical construction-friendly format, avoiding unnecessary background information and preambles that are not required for day to day site management. In execution, the site-advisor doesn't need the 'why', they just need the 'what' and 'when' with regards to compliance management. In fact, with an effective system, we shouldn't need a traditional EMP style document at all. The obligations and mitigative actions can be included directly into an effective system.

Developing a compliance management strategy as early as possible and integrating practical, construction risk-based experience into the project approval process will reduce risk and potential costs that might arise from the commitment to unachievable obligations.

Schedule delays, design re-work and contractor cost variations are also common when there is not a strong interface between the approvals team (incorporating implementation experience) and the design/construction teams.

There are number of ways to mitigate this risk, including developing minimum environmental requirements or parameters for design, as we often see in the oil and gas sector with the environment in design process; the development of the equivalent of a design EMP or minimum environmental requirements ensures that the engineers design within clear parameters, why also reduces design rework.

Another recommendation is to consider a construction practicality review or workshop, involving construction focussed people in the room to review the mitigations and proposed obligations.

It is a common problem that we focus entirely on project approvals and don't pay attention to what is being committed to. This was evident on a large mining firm that engaged a contractor to manage the approvals process for a major greenfield mine. After they had secured the approval it was evident that the project approval only allowed for footprint of the mines without any hectares for supporting infrastructure. The client had to undertake another large impact assessment and approvals submission in parallel.

### **Integrating Environmental Expectations into the Procurement Process**

In our experience, the single most effective way for clients to minimise environmental risk, and cost, on their project is through the performance of their contractors / sub-contractors.

The contracts and procurement processes are a critical vehicle through which practical approvals conditions and obligations should be applied. In Western Australia this often entails simply stating approvals obligations, ignoring non-approvals based contractual expectations that will impact on performance e.g. minimum qualifications/experience of environmental professionals. This often results in avoidable scope and cost variations or non-performance. This links back to the points about poor audit and enforcement i.e. If the Regulator audits projects effectively, non-compliance will be identified and acted upon.

Integrating practical, risk-based environmental expectations into the procurement process, including the contract documentation and evaluation processes for major contracts allows clients to ensure that all compliance commitments are cascaded down to their contractors/sub-contractors before contracts have been signed. Including these expectations in the competitive tender stage ensures that the project owner can dictate how much risk to take or pass on to the contractor. This also reduces costs to the client as avoidable post-contract variations often occur.

This was demonstrated with a very large mining project, where the project owner drew up a lump-sum Engineering, Procurement, Construction (EPC) contract with a clause stating that *the contractor should have one environmental professional for every 50 construction workers or at least one environmental professional (paraphrased)*. While the contractor recruited an adequately sized environmental team, the contractor defined that clause as only needing one environmental professional for sub-EPC component (mine, rail and port). As a result, the greenfield rail project only had one environmental professional. The result was that the on-site environmental professional only had time to focus on the highest risks with several requirements not considered. This is an example of how a simple contract clause can result in significant environmental risk in construction, undermining many millions of dollars spent on a robust environmental impact assessment and approvals processes. This was further compounded by lack of attention by the Regulator, which therefore conveys the message that 'we can get away with not implementing Regulatory obligations', which effects projects in the future.

### **Effective and suitable compliance management systems**

Compliance management expertise in Western Australia is relatively immature as the consulting sector has been dominated by greenfield projects and therefore EIA and approvals capabilities. As a result, many large projects have ineffective compliance management tools and systems; in fact, ISO14001 Environmental Management Systems are still not a 'business as usual' expectation in construction, which is surprising considering the scale, complexity and risk associated with large construction projects.

We often rely on the strength of the individual Environment Manager, rather than working in conjunction with an effective management system, which should reduce the reliance on the individual and de-risk project.

The number of environmental incidents during project construction is often peaks at the beginning and the end of project construction. The latter is typically due to the early demobilisation of experienced people, while the former results from the commencement of construction with inexperienced personnel and undeveloped systems and processes to manage compliance.

An environmental compliance system should be developed earlier in the project lifecycle, preferably alongside the approvals process prior to construction. Often a management system is only developed, if at all, as construction commences. The demands of a new construction site inevitably result in the development of ineffective systems as the focus of the team turns to the activity on-site.

Developing the system earlier allows the environment team to more effectively support contractors/sub-contractors, ensuring that the team 'hits the ground running' when construction begins. The focus of a construction environment team should be overseeing and supporting construction activity, not developing the tools when construction is already underway.

Often management systems are not applied until an asset is operational, or they lack the functionality to manage construction site activity. Yet the environmental risks during construction can be very high, with

numerous contractors working back-to-back and a range of high-risk activities such as clearing and dredging.

The environment team working for the Engineering, Procurement, Construction, Management (EPCM) for a very large, multi-billion-dollar LNG construction project in a very sensitive greenfield environment believed they had a management system. However, what they had was an excel spreadsheet with thousands of rows of environmental compliance requirements. The lack of automation and intelligence within the system resulted in important compliance expectations not being undertaken for the duration of construction. It proved very challenging to try to develop an effective system once the project construction had commenced for a wide range of reasons, not least the reluctance of the client to approve additional costs.

### **Getting the right team – recognising the different skill set required for planning, construction and operations**

We need to recognize the different skills sets between managing environmental risk in construction and undertaking an impact assessment. Too often we see the approvals manager become the construction environment manager as the project moves from planning and design to construction when we should be engaging environmental professionals with experience in the construction phase.

### **Health and safety is different to Environment**

There are similarities and differences between the management of Health, Safety and Environment risks, but major projects must have experienced and appropriately qualified environmental professionals on site during construction.

There are typically many more environmentally focussed legal obligations than there are health and safety obligations, which reinforces the need for effective systems. It is also important that the person responsible for environmental management on-site understands the key risks from a scientific perspective, including environmental sampling techniques.

An example of the negative impact of not using adequately trained environmental professionals is the case of a large mine expansion project, involving a significant port dredging program. The dredge was stood-down (at significant cost) because elevated contamination was recorded in a water quality sample. We had previously attempted to place an environmental professional on-site, but the project delivery team had insisted that the health and safety superintendent would be able to manage the risk. Our team was immediately called to site to investigate and when we asked the health and safety professional to demonstrate the water quality sampling technique we discovered that he was merely throwing a rope and bucket into the water and dragging it up the side wall of the dredge area, scraping concentrated levels of naturally occurring contaminants into the sample in the process. We were able to re-sample, demonstrate that water quality was below levels of concern and from that point onwards, a full-time, senior environmental professional was part of the site team.

### **Regulator Oversight – Holding Projects to Account**

Environmental management performance on major projects is often sub-standard if the Regulator doesn't adequately hold the project developer/owner accountable for environmental performance by not effectively inspecting during construction. This means that developers and their contractors 'get away with' poor environmental performance. This in turn sends out the message to industry that they can get away with it and they are even less likely to perform on the next project.

If the Regulator more effectively inspected projects during construction and held developers accountable, then the developer would be forced to drive improved performance from their contractors. This may result in a cost variation, but this should further encourage the developer to embed environmental expectations more robustly into the procurement and contract processes.

Multi-billion-dollar greenfield projects in sensitive locations sometimes either haven't been inspected by Regulators at all, or they have been inspected by inexperienced people who don't know what to look for. This includes regulators looking at inert solid waste management whilst high risk activities like dredging get ignored. I've seen experienced contractor environmental superintendents take the Regulators to look at what they want to show them, avoiding the things that should be inspected.

One solution is for Regulators to outsource inspections to appropriately qualified and experienced consultants. This is particularly relevant in places like Western Australia where we have a boom and bust resource-based economy which puts huge stress on the Regulators.