The **vision**
to stay ahead

**Case Study
Delivering high performance
Network Rail
Infrastructure Projects Signalling**

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This case study tracks the improvements within Network Rail Infrastructure Projects as they have embraced the P3M3[1] model and used it to drive up their performance over the last four years, with a spotlight on their Signalling division.

The case study outlines the following:

- The drivers for change and how these were used to create energy to improve
- How P3M3 was used to baseline performance and as a framework to prioritise improvements
- The key capabilities delivered by the internal change programme
- How IP Signalling has become the current global benchmark and exploited the capability to deliver outstanding results
- The key characteristics of high performing organisations

Key statistics from performance as a result of the increased maturity:

1. 35% improvement in project schedule adherence in four years, from 63% in 2014 to 98% in 2018
2. 41% reduction in lost time from accidents
3. 97% reduction in train delays from Signalling project overruns since 2016
4. 78% reduction in post asset implementation failure since 2016
5. 6% reduction in headcount whilst delivering an increased volume of work

Key facts about P3M3

1. It is based on the CMMI maturity levels, there are three models and they encompass around 20 processes
2. It is designed to be used to as a performance improvement framework as much as a measurement framework
3. It is independent of any body of knowledge and as such recognises any form of effective practices
4. It was first established in 2005 and is now in its third version

More information on P3M3 can be found here

> Network Rail Infrastructure Project invests around £6bn per annum on programmes and projects roughly 22% of the public sector investment .
>
> At any one time Network Rail IP will have around 1100 project running.

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Some key lessons for other organisations:

- **Change was not a technical achievement** - The achievement of level 3 was the result of strong leadership and change management.
- **The costs of moving to Level 3 were relatively minimal** as the majority of the systems and processes were already in existence but weren't being used.
- **Design a flexible but effective controls framework** that enables local groups to apply solid principles without stifling innovations and agility

How Aspire Europe provided support:

In addition to undertaking assessments and evaluations, we have provided the following additional support:

1. Support for the design and roll out of the Peer Review Assurance processes
2. Training of the central Centre of Excellence team on best practice
3. Lessons learned review of Thameslink and development of supporting case study
4. Professional development programmes based on eLearning
5. Advice and input into the improvement plans

> "The toughest step on the maturity journey is from level 2 to level 3, as organisations have to establish the common ways of working and accept there is an organisational wide approach. At level 2 localism can still exist and making improvements involves undoing years of bad practice."
>
> Rod Sowden.
>
> P3M3 Lead Author

This case study has been written by Rod Sowden, Managing Director of Aspire Europe Ltd and Lead Author for MSP® and P3M3® and author of a number of other books on how to deploy programme management effectively.

Aspire Europe specialise in supporting organisations deliver their performance improvement strategies.

> *"If I had to pick out one thing that I would like people to take away from this case study, the one thing that made the significant difference, it would be the creation of an environment where people feel safe to challenge themselves, others and their management team, always looking for a way to deliver safer, more easily, faster and more efficiently. Not only when things don't go to plan, but to constantly seek improvement"*
>
> *Kevin Robertshaw. Major Programme Director, IP Signalling*

Throughout the case study we have colour coded 'highlight' boxes:

	Key point to note
	People quotes
	Performance metrics

Introduction to Network Rail

Infrastructure Projects

With the public persona of the rail industry being a challenge, probably due to our own personal experiences of difficult journeys, it is easy to ignore the sheer scale of investment that is going on in the rail industry and the level of change it is coping with across a highly complex contractual environment.

Within this context Network Rail delivers the biggest capital investment portfolio in the UK. It is therefore rightly under pressure to deliver great programmes and projects that will provide the nation with a 21st century rail service.

As an organisation, Network Rail Infrastructure Projects (NRIP) have always been great advocates of industry best practice, whether it was ISO, British Standards, or professional accreditations. This provides them with the basis for measurement and improvement across a range of areas.

> *"Network Rail's P3M capability improvement journey has required a belief in the effectiveness of pursuing improvement by the use of a recognised maturity model, consistency of vision and strong leadership commitment. "*
>
> *Huw James. Programme Management Director*

With major investment being made in the rail industry, the leadership of Network Rail recognised they needed to not only improve performance and productivity but have independent verification of this against an international industry standard model.

In 2013 the NRIP leadership investigated the options for independent evaluation of performance. After consideration of the options, they selected P3M3 as the performance and maturity measurement framework to be used. Their reasoning being:

1. It is not aligned to a specific body of knowledge, so it is not testing compliance to a regime or philosophy
2. It has an infrastructure of independent accredited assessor organisations available
3. It has a proven track record in a range of organisations, including transport
4. It is internationally recognised.

One of the challenges was how to design an assessment of an organisation as complex as NRIP and which models (Portfolio, Programme and Project) to use and where.

> The support of Outperform and Aspire Europe was enlisted to support the design and delivery of the assessments.

Project management maturity assessments were undertaken of the four regional project delivery organisations plus the national portfolios of Signalling and Track projects.

The initial assessments were undertaken in 2014 and produced a range of results that rated NRIP at Level 2 maturity, which is largely in line with the business "average". At the time this was not a good message for an organisation delivering a massive tranche of government investment that believed itself to be an industry leader.

Whilst NRIP was trying to digest this rather bitter pill, a number of events occurred:

- London termini work overran causing major commuter disruption and the resultant impacts on image and reputation
- There were major issues with overspend on Great Western electrification
- The Hendy Review of NRIP that set out the major changes needed

These events provided the evidence that the P3M3 assessment had in fact been accurate, as the framework had highlighted the weaknesses that unfortunately manifested themselves in the months that followed.

Some of the issues identified in the 2014 assessment were:

1. The corporate project framework (GRIP) was unwieldy and often avoided
2. Teams were operating independently with no sense there needed to be a consistent approach
3. Weak risk management was failing to spot potential failures
4. Sponsor conflicts with project teams and a lack of professionalism
5. Requirements management was weak, making control of scope difficult
6. There was no culture of improvement, generally the delivery divisions were doing things the way they had always been done

> *"I believe the use of the P3M3 model is most effective in our business as it reviews how all areas of the business contribute and collaborate to achieve our goals."*
>
> *Huw James. Programme Management Director*

The NRIP improvement journey began in 2014. The outputs of the P3M3 assessment were analysed, and with several dozen recommendations made, the level of change was significant. In total 26 projects were scoped.

This level of change required effective governance and co-ordination. A change programme was established with formal governance and an overarching plan was developed with a clear blueprint of what the future operating model would entail.

An experienced programme manager was put into place to help establish momentum and manage the interdependencies across the delivery groups. The delivery model involved the central functions developing capability and the regional operations adapting it.

The management structure at the top of NRIP was changing at the same time, with new faces, new energy and increasing recognition that collaboration would bring increased efficiency and effectiveness.

> "We'd had many attempts to improve performance during my time here, but this time we used P3M3 and that gave us common framework we could all buy into."
>
> **Paul Stanford, GW&C, Head of Programme Management. 2016**

Getting on the right track

The improvement journeys for organisations are dependent on a variety of conditions, including scale, complexity and their culture, which is normally dependent on their sector. Engineering organisations are notoriously difficult to mobilise, whilst organisations that exist in unstable market or political environments are difficult to bring under control.

Another key factor is the starting level of maturity. An organisation in a low level of maturity such as Level 1 can move to Level 2, often in a year to 18 months, whereas an organisation at level 2 may have well-embedded local practices and behaviour that take time to change so the improvements can be much slower.

For an organisation such as Network Rail moving up the maturity levels was far more challenging, with 0.5 of a level in two years a more a realistic timescale. Their improvements have required ending a traditional approach and replacing it with a new way of working.

> *"Improvements have always been focused on what improves our customers experience and business performance demonstrates that the benefits are sustained and tangible."*
>
> *Huw James.*
>
> *Programme Management Director*

The changes that were set in motion were extensive, but the key areas that should be of interest to others can be summarised as follows:

Project Management Framework – GRIP[2]: this framework had been in place for many years and there had been various evolutions where it had become heavy and burdensome, then cut down to the point where it was of little relevance.

The re-design of the GRIP framework was a critical step in the improvement process.

The revised version moved from the traditional view of projects as high, medium and low risk to assessing the levels of control they needed. This also removed the cost of the project from the equation so it was entirely focused on achievability.

> During the 2014 assessment it became clear that the GRIP framework had become marginalised and to quote one director, "we have wholesale non compliance with GRIP."

They then applied four levels of control. For projects where there was predictability and experience, their control regime was significantly reduced, in some cases to a set of requirements and a project plan, whilst the complex projects had a tighter control regime. It is important to remember cost was no longer a criterion so now they could spot the small but potentially volatile projects as distinct from the expensive but predictable initiatives. This was a major shift culturally and behaviourally.

In summary, for low risk projects the burden of control was largely lifted, for higher risk projects it was significantly tightened.

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[2] The GRIP framework is based on PRINCE2® and the concepts of product-based planning, it has a number of stage gates at which point a number of products should be produced.

Integrated assurance – this is a rather overused term as very few organisations take a joined-up view of the various audit and checking mechanisms. In 2014 NRIP were no different with lots of reviews driven by a variety of criteria, government Gateway reviews, stage gate reviews that never stopped or changed projects heading for failure – as with many organisations it generally it had little impact.

The solution designed used the three lines of defence model, which integrated the P3M3 assessments, Stage Gate reviews, systematic compliance checks and the implementation of a concept called Peer Review.

Peer Review was designed not only to reduce the risk of failure but to enable greater sharing of knowledge and experience across the top tier of the organisation. The model was based on the OGC Gateway model, but also took account of the NAO DECA[3] assessment to provide it with a rounded approach.

> Network Rail IP have trained their senior leaders and managers on how to deliver effective Peer Review assurance assignments. This has contributed significantly to the improving delivery performance.
>
> Over 200 now hold a formal qualification in delivery of Assurance Reviews.

The reviews were led by senior directors supported by teams of experts, a major commitment by NRIP leadership. The implementation included a training programme for the leaders and team members on the process and principles of the framework. The training programme included formal C4CM[4] qualifications for the review team members and a vocational qualification for the review team leaders

> The leadership style and culture moved to a much more active and enabling style by 2016 from the rather complacent or indifferent attitudes that we found in 2014.

A key element of the success was the supporting process. Actions and recommendations were tracked to ensure they were implemented, but the process was under continual review for improvement and the information coming out of the reviews was analysed for trends that were then used to improve GRIP and other supporting processes. It truly is an example of integrated assurance that has significantly reduced failures.

Professional disciplines - there was a radical move away from the generalist skill set to focus on developing professional groupings to enable improved knowledge sharing between cohorts of professionals which would improve standards across the discipline.

This recognised unique groups such as commercial, risk, planners, communications, resource and requirements management who could manage the performance improvements and accredit themselves through professional bodies.

Requirements is at the root cause of many project failures, and yet is often seen as outside of the boundaries of project management professionals. Network Rail

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[3] DECA is an assessment developed by the National Audit Office that enabled organisations to test the likely success of a project or programme against a set of criteria that were often identified as causes of failure
[4] Centre for Change Management provide a range of qualifications for P3M performance measurement, in this case they provided two layers of qualification to cover the two levels of accreditations, Review Leader and Review Team Member

grasped the challenge and established a Head of Requirements role to set standards and co-ordinate improvements to processes in this area.

As part of this development, NRIP pioneered the development of Sponsorship, noted as a particularly weak area in 2014 and deemed as being at the root of many of the issues being faced.

Strong leadership: all the other ideas and changes would have come to nothing if there had not been strong and energetic leadership. Between 2014 and 2016 there were many changes in the top tiers of NRIP that provided the focus and energy to enable the improvements that followed.

Introducing NRIP Signalling

> 97% reduction in Signalling project overruns since 2016

The Signalling leadership team was particularly proactive in grasping the opportunities that came from the new culture that was beginning to emerge with NRIP.
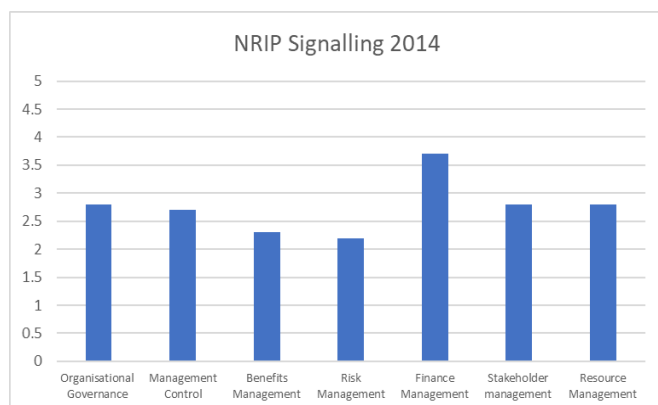
Signalling had advantages and disadvantages over the other NRIP regional operations. The main disadvantage being they were a national portfolio split into regions of their own, which meant they had legacy working practices across the country that they needed to challenge and change.

> In NRIP Signalling, the headcount has been reduced by 6% in the last four years with the similar work volumes

The national nature of the organisation meant they also had a very complex portfolio of customers in the Network Rail routes, who themselves were going through change and increasing their demand for value for money.

The advantage they had was that the nature of the signalling projects was complex, but based on a narrower set of disciplines, so there were opportunities to analyse work, develop and understand the trends, and work to refine and manage implementations.

As part of the first round of assessments, Signalling scored reasonably well on the first assessment, doing particularly well on finance management but also with decent scores in the key areas of governance and controls. This meant the fundamentals for their own improvements and contribution and alignment with the wider NRIP improvement programme were already there.

NRIP Signalling 2014

> I am incredibly proud of our recent P3M3 maturity assessment result; it is a direct reflection of the passion and professionalism of the entire IP Signalling team. We have worked hard to find the right balance between process, information, tools and people, ensuring that rather than constrain people we free them up to adapt, improve, evolve and change what they do.
>
> Kevin Robertshaw. Major Programme Director, IP Signalling

Checking the direction of travel

Network Rail commissioned the next round of assessments in 2016 to establish the level of progress. From the outset of the assessment it was clear that some significant changes had happened within the organisation.

In the 2014 assessment it was often difficult to gain access to information as it was dispersed across numerous storage systems and setting up meetings and engaging managers was also difficult for a variety of reasons. In 2016 access to information was fast, diaries were cleared for meetings and there was active interest in getting involved with the assessment.

The foundations laid by the central group to provide the capability to improve performance had been adopted at different rates by different groups, however, the baseline benchmarks had risen everywhere.

The results of the assessments were striking, not only had the six delivery directorates improved on their previous scores, but they all managed to achieve P3M3 Level 3 using the full diagnostic model. For context, less than 10% of the organisations that have been assessed using P3M3 (some 500) have achieved level 3.

"The key to our success was to manage a balance between providing a service to the delivery team and at the same time applying effective governance, assurance and control processes/tools on the projects."

Wajjahat Khan

Head of Strategic Planning and Controls

IP Signalling

The assessment highlighted further impressive improvements, namely that every delivery group had improved against every criterion in P3M3 and that the Signalling Division had achieved two of the highest project management scores we had seen in 10 years of assessments.

Each region faced very different challenges within their own portfolio of work and customers, and as such, the rate of progression was never likely to be equal.

Some key lessons for other organisations wishing to improve performance:

- **Change was not a technical achievement** - The achievement of level 3 was not a technical achievement but the result of strong leadership and change management.
- **The costs of moving to Level 3 were relatively minimal** as the majority of the systems and processes were already in existence but weren't being used.
- **Design a flexible but effective controls framework** that enables local groups to apply solid principles without stifling innovations and agility

The costs of moving up the performance levels is one of the big misconceptions about maturity and performance. Many of the systems and processes needed to deliver are in place but they aren't being used to anything like their potential.

What NRIP did exceptionally well was to create a framework that enabled controls to be tightened where they needed to be whilst allowing more autonomy and flexibility where they were needed as well.

> *"Use of metrics to highlight areas for improvement is key. Knowing something is not working as well as it could versus thinking something is not working is key. "*
>
> *Andy Smith, Head of Programme Management, IP Signalling*

The key to this was moving away from the traditional risk rating of projects by cost and establishing "Levels of Control" that could be flexed where and when appropriate, in a controlled way.

Not surprisingly the most complex projects were also the biggest and most expensive so these still attracted the highest level of controls. When the new criteria were applied, their level 1 projects dropped from over 400 to around 125, which enabled much greater focus on the genuinely risky, rather than just large projects.

> By analysing performance, Signalling have reduced post - project asset implementation failure by 78%, from 30,288 minutes in 2016 to 3,861 minutes in 2018.

A major contributor in getting to level 3 is strong leadership, delivering culture change and using investment wisely. Many level 2 organisations have spent the money to establish the capability, they simply haven't managed to achieve the outcomes needed to achieve level 3.
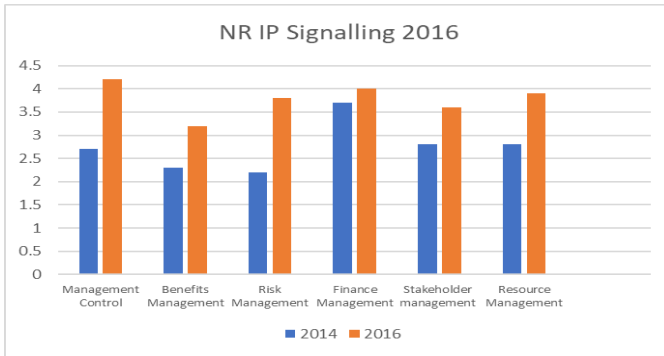
In 2014 the recommendations were wide ranging. By the time the recommendations from the 2016 assessment were agreed they were far more focused primarily on maintaining momentum towards improvements across the regions, particularly in the following areas:

1.   Develop and implement the knowledge management strategy and deploy more continued improvement
2.   Develop the P3M professional strategy to become the sector exemplar
3.   Fully deploy the improved requirements management processes
4.   Focus on stakeholder management as this was the weak area across all regions and was becoming an increasingly important element of the project management function

Signals Ahead

NR IP Signalling 2016

NRIP Signalling are at the vanguard of the new technology arriving on the rail network. In the 2016 assessment the Signalling division emerged as the high performer of the six groups reaching an overall score of 3.8. This was a significant jump from 2.8 in the previous assessment and their story projects an even more impressive journey.

In the 2016 assessment all the groups were delivering consistently at level 3, gathering information, delivering to a consistent set of processes, intervening where necessary and significantly improving the quality of management information available.

One of the key changes that enabled Signalling to improve was to tighten up on change control. At the time of the 2016 assessment they had already gone over 12 months without a project running late. They achieved this by having a much more focused approach on scoping projects, removing ambiguity within the requirements and ensuring change control was being applied consistently.

> Schedule Milestone adherence by Signalling projects has improved from 64% to 84% between 2014 and 2016.

> In 2014 only 32 change requests were raised throughout the whole year. In 2018 this has risen to 122 as all parties recognise the value of the process and engage with it.

Their analysis of the performance had identified that the projects which underperformed had been subject to ad-hoc change from the business that hadn't been funded. At times, this change of behaviour was not popular with stakeholders as it was misconstrued as being uncooperative, when in fact it was increasing professionalism and protecting the business.

The differentiating factor that put Signalling above the others was that they were actively analysing the information and seeking out opportunities to improve based on the analysis of their trends. These are characteristics of the P3M3 level 4 maturity and the work they were undertaking was enabling them to avoid common problems and intervene before failure happened. This was reflected in their 2016 score for Management Control, which they were analysing and intervening in to reduce the chances of failure.

All the perspectives improved, but there was also a noticeable improvement in Risk, where the establishment of the professional discipline to support the project teams was enabling the consistency which delivered the level 3 rating, but also the use of performance data to embed better analysis of risks and the avoidance of failure. The 2018 reassessment of Signalling has just been completed and the momentum that was established between 2014 and 2016 has been maintained and they have reached the very unique situation of achieving level 4 across all perspectives.

Health and Safety
LTIFR & CLOSE CALLS

NRIP Signalling are the first level 4 accredited by Axelos. They have reached the top spot in the Aspire Europe P3M3[5] database on all seven perspectives, so they genuinely are setting the global gold standards.

Primarily the focus was on developing a greater understanding of their areas of weakness and addressing them. To achieve this requires a culture that sees an issue as an opportunity to improve and a willingness to deal with difficult issues and not just tolerate "acceptable".
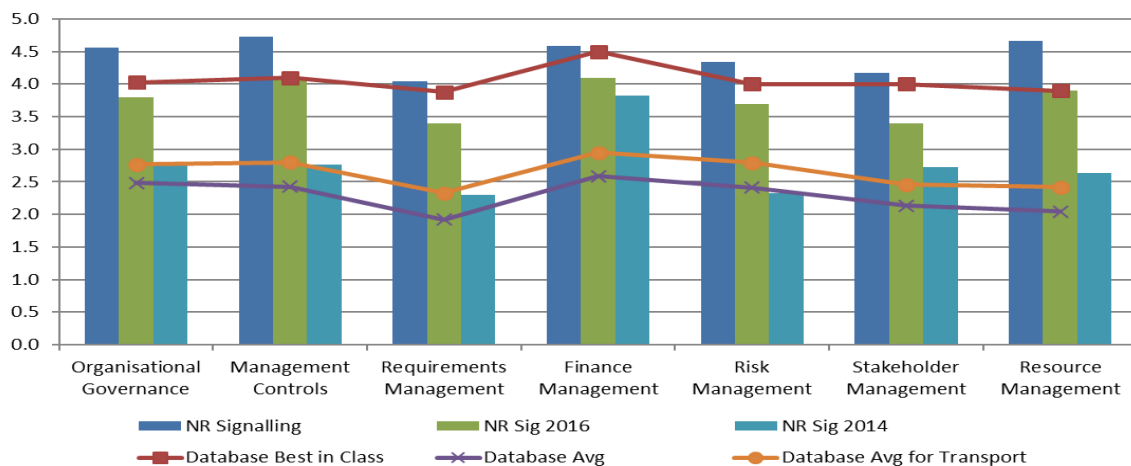
Many organisations talk about this, but when seen in action it is quite inspirational.

> *"Get to the root cause of the problem. Don't assume you know what is not working just because you are in charge."*
>
> *Andy Smith, Head of Programme Management, IP Signalling*

Their analysis had identified key processes steps which were causing delays. Their focus on their performance in areas such as approval of designs has been relentless with trend profiling enabling them to eradicate the delays which were ultimately threatening budgets.

The improvements in requirements and stakeholder management are related. They had already done a lot of work to tighten up on requirements in 2016. At that time their focus had been on cutting out the ad-hoc changes to requirements and tightening up the change control process so there was far better control.

The rise to level 4 was recognition that ultimately, by establishing better strategic relationships with the customer base, they could have more influence on the development of requirements at an earlier stage thus removing delays and changes once into delivery.

Consequently, the senior leadership effort and energy needed to engage with customers dispersed across Britain has taken much time but the rewards for the project teams and the wider Network Rail organisation are clear to be seen.

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[5] Aspire Europe have been collating P3M3 assessment results from around the world since 2008, the database of scores is the only one in existence and enables to analyse and compares organisations within and across sectors.

Involving staff in the improvements has been a key characteristic of the improvement over the last two years. This latest assessment has provided some startling changes in the attitudes of staff[6].

The first thing to note is the numbers of staff responding to the survey. The average response rate is around 65% of those invited, the Signalling survey had a 95% response rate.

Between 2016 and 2018, the following changes really stood out:

Staff Engagement – over 60% of the staff knew how to request or propose a change to a way of working and 38% had actually used the process to request an improvement, double the level of engagement we have seen in other organisations.
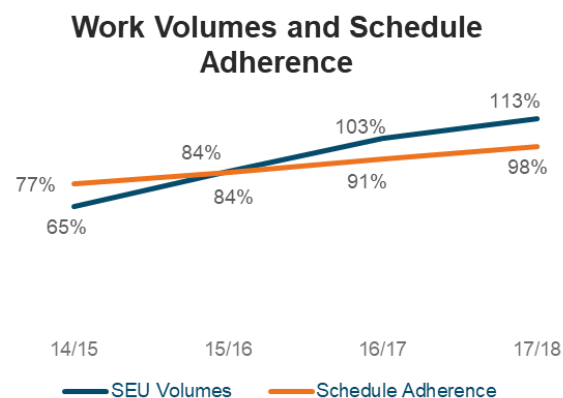
Staff who believed the processes being used were pragmatic and helpful jumped from 30% (a good score anyway) to over 45%, with only 5% believing they were bureaucratic.

Valuing of profession – this is usually a good measure of the level of cultural embedment of project management. The most common view is that team colleagues value them rather than their sponsors or senior managers, in fact, a very common answer is not being valued at all.

In Signalling, the appreciation of their leadership has come through clearly, with nearly 40% believing that senior managers appreciate project professionalism. The more stunning response was that over 20% believe their sponsor values their professionalism. We have not previously seen any survey go beyond 10%.

Staff training produced another remarkable result. In 2016, 18% of staff had received training over the previous year, by 2018 this had risen to 56%. This is another stunning result and illustrates the commitment to developing staff and the value of the central eLearning site licence package which made extensive materials available to broaden access across the organisation.

Work Volumes and Schedule Adherence

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[6] The Aspire Europe approach to a P3M3 assessment includes and extensive survey that provides us with valuable insight into attitudes that enables us to build a rich picture of what is happening in the organisation.

And finally ………

To bring this case study to a close, we would like to finish with some advice, in their own words, from the team at the core of the change and improvements

Andy Smith, Head of Programme Management, IP Signalling

- ***Engage the staff*** - *Change programmes only work if staff are engaged in the proposed solution. If they don't see value in it because they don't believe that is the real issue then you won't get the buy in and hence the change and improvement.*
- ***Keep people informed*** – *let them know what is going on, when and why so they are engaged throughout the process. Implement metrics to measure/assure the improvement is embedded and having desired outcome.*

Wajjahat Khan, Head of Strategic Planning and Controls, IP Signalling

The P3M3 assessments allowed us to understand our strengths and weakness against the seven P3M3 perspectives. The output from these reviews were converted into the key improvement initiatives with clear remit, action owners etc. The key success factor was that once the improvement plan was agreed by the Executive the progress was monitored against the baseline plan and the latest update is communicated to all the staff members on a regular basis We had to ensure there is no disconnect between the PMO and the delivery teams who are scattered around the country. In my view you could have all the best systems and processes at your disposal and everything is running smoothly within the PMO but if it was not benefiting the delivery teams then it is of no use.

- **Sharing knowledge by becoming a learning organisation –** we knew that to move toward achieving a level 4 performance we needed a major change by focusing on utilising knowledge more effectively through the sharing of lessons and building a greater understanding of trend. We embedded a robust lesson learning process within the key points of the project lifecycle (at the end of development, Design, Build and Commissioning stages).
- **Developing our people** by focusing on professional development strategies and this was demonstrated by linking the training requirement against the individual competency levels. To ensure a consistent level of engagement, there is a highly motivated leadership team within Signalling that is continually seeking opportunities to improve.
- **Introducing an active culture** to learn and improve. For example, the improvement process for the Planning and Controls encourage the project community to continue with establishing similar learning processes.
- **Improving our Systems, Tools and Processes –** different structures, processes and systems give rise to inefficiency and hinders effective interfaces and assurance. We mandated an approach in the PMO that any new process/system will undergo rigorous checks to ensure once deployed it has minimum disruption and must add significant value to the end users in the delivery teams and other key stakeholders (client etc). In parallel to this we encourage the end users to provide feedback on a regular basis which helps us to improve our local processes, tools and methods.
- **Being self-critical and restless –** we really benefitted from this behaviour which is unique to Signalling. This has enabled us to focus on the real issues and helped us to keep improving
- **Measuring performance -** we undertook a significant challenge to ourselves by introducing various forward-looking performance indicators to forecast and manage the future rather than focusing too much on the past performance
- **Valuing Assurance** – in order to be clear about what the different people in the delivery process need to do, we adopted the 'three lines of integrated assurance' model as a way of organising

everyone carrying out this activity. Assurance is used proactively to support major governance decisions (e.g. stage gates and scheme commissioning) and is embedded into project controls and used to inform wider improvements.

The final word – Robert Cole, P3M3 assessor 201

"Something I noticed about Andy and Wajjahat was their ambition to improve. I don't think they would admit to such a personal characteristic but I think it drove them in a way I haven't seen before.

That characteristic should not be underestimated, they have emphasised the data and analysis, but without ambition to use that information it is just information."