PRODUCT ACCEPTANCE – FREQUENTLY ASKED QUESTIONS

We receive a lot of queries relating to our Product Acceptance process and other associated processes, such as Design for Reliability and Supplier Quality Assurance. This document incorporates a list of those that have been asked most frequently.

If your query is not answered below, please contact us at prodacc@networkrail.co.uk.

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1. PRODUCT ACCEPTANCE

Q1 – What is Product Acceptance?

Product Acceptance is an assurance process that was initiated in 1994, so that Network Rail (and formally Railtrack) can make sure that safety critical products used or installed on our operational Infrastructure are safe, fit for purpose, compatible, reliable and do not export unacceptable risks to the infrastructure.

Q2 – Who manages the Product Acceptance process?

The Product Acceptance team is a small centrally based team that reside in Network Rail's Technical Authority directorate. We manage the administration of the process on behalf of Network Rail Assurance Panel (NRAP) and work with stakeholders within the Technical Authority and Route Services to make sure that the process is managed in line with the applicable Network Rail and industry standards.

Q3 – Do I need Product Acceptance for my product?

If your product is likely to be used on the live operational infrastructure, it is likely to require Product Acceptance. To assist with clarification, our guidance document "How to Decide what needs Product Acceptance" was created and is attached to the application form. The guidance document includes the vast majority of categories of products that we receive, however, if your product is not included within the document please contact us at prodacc@networkrail.co.uk and we can clarify with assistance from our engineering colleagues.

Q4 – What products are covered by the scope of Product Acceptance?

Items that are classed as safety critical for use or installation on the operational infrastructure require Product Acceptance, the process confirms that the safety requirements necessary to mitigate risks to an acceptable level have been addressed. Items that require Product Acceptance are marked "controlled" or "controlled limited criticality" within our guidance document "How to Decide what needs Product Acceptance" which is linked to our application form.

Q5 – What items do not require Product Acceptance?

There are categories of products that do not require Product Acceptance. Examples of these include low risk items such as PPE, boundary fencing, worksite lighting, civils assets (which are assessed as per Network Rail civils standards), rolling stock and most items within above surface station environments such as customer displays and help points, escalators and station surveillance products. Quite a few examples are listed as "uncontrolled" items in our guidance document "How to Decide what needs Product Acceptance", further guidance can be obtained by contacting us at prodacc@networkrail.co.uk.

Q6 - How do I obtain more information relating to the Product Acceptance Process?

For external parties, we have a lot of guidance material linked to our Network Rail web space here: https://www.networkrail.co.uk/industry-and-commercial/research-development-and-technology/product-acceptance/.

For internal parties we also have a connect page here: https://networkrail.sharepoint.com/sites/myconnect/technicalauthority/pages/product-acceptance.aspx;

and a HUB site here: https://productacc.hub.networkrail.co.uk/Pages/NRHome.aspx.

You can also email us via prodacc@networkrail.co.uk if you have any further questions.

Q7 – Which other NR stakeholders are involved throughout the Product Acceptance process?

Although the Product Acceptance team manage the administration of the Product Acceptance process, the following are key Network Rail stakeholders who are significantly involved during the end to end process:

- Network Rail Technical Authority Engineering teams undertake the technical review of all the products or changes to products. The relevant Network Technical Head or delegate who owns an asset category will assign a Lead Reviewing Engineer to a product. The Lead Reviewing Engineer will then provide a set of technical requirements to the Network Rail applicant, so that the can then provide evidence back to meet those requirements. The Lead Reviewing Engineers also assess requested Design for Reliability (DFR) evidence - see the DFR section in this document for further information.
- Network Rail's Network Technical Head's within the Technical Authority, or their delegates are responsible for assigning Lead Reviewing Engineers to a product and for endorsing any resulting Product Acceptance certification if the product gains Product Acceptance.
- Network Rail Category Managers, who reside in the Route Services directorate review all incoming products or product changes to make sure they align to commercial strategy.
- Network Rail Supplier Quality Assurance, who reside in the Route Services directorate review applications from new to determine whether any audits of the company's manufacturing facilities may be required.
- Network Rail Catalogue Management, who reside in the Route Services directorate manage the input of any catalogue numbers, that are provided to products and parts that have received Product Acceptance into Network Rail's istore catalogue and the industry visible PADSnet catalogue. Catalogue Management also manage any changes to catalogue entries and can be contacted at cataloguequeries@networkrail.co.uk.

Q8 – How do I apply for Product Acceptance?

We have an online application form which you can access here: https://www.networkrail.co.uk/industry-and-commercial/research-development-and-technology/product-acceptance/product-acceptance-form/.

Q9 – Who can Apply for Product Acceptance?

All applications need to be submitted by or on behalf of a Network Rail applicant who is prepared to act in a sponsorship capacity and who can demonstrate a business need to the product or product change. Network Rail applicants normally reside within Network Rail projects or within our route organisations.

For Plant assets (i.e. On Track Plant, On Track Machines and tools) applications can also be submitted by Plant Assessment Bodies who have been delegated by the Network Technical Head to externally undertake technical reviews on Network Rail's behalf.

Q10 – How do I find someone within NR who would be interested in progressing my product through Product Acceptance?

As most products are required for Network Rail Project or Route works it is advisable to engage directly with our projects and routes, or via a contractor organisation working on an NR Project as they will have a contact within that project.

Alternatively, if your product is a new technology that you believe meets one of our Challenge Statements located here: https://www.networkrail.co.uk/industry-and-commercial/research-development-and-technology/research-and-development-programme/challenge-statements/ you can email the Research and Development team: R&D@networkrail.co.uk.

Q11 – Are there any Network Rail Standards that relate to Product Acceptance?

Yes, the following Network Rail standards relate to Product Acceptance:

- NR/L2/RSE/100/05 - Product acceptance and change to Network Rail operational infrastructure.
- NR/L2/RSE/100/07 - System Review Panels.

These standards fall under a suite of standards owned by Network Rail Assurance Panel (NRAP) which also include NR/L2/RSE/100/01 – Network Rail Assurance Panel, NR/L2/RSE/100/02 - Application of the Common Safety Method for Risk Evaluation and Assessment, NR/L2/RSE/100/03 - The application of the interoperability regulations for infrastructure projects, which may be relevant to some products requiring Product Acceptance.

- NR/L2/RSE/0005 – Design for Reliability, also applies to most products that require an engineering assessment as part of Product Acceptance.

Q12 – Who undertakes the Technical Review of products?

Network Rail Technical Authority (TA) and Network Rail Telecommunications (NRT) Engineering teams undertake the technical review of all the products or changes to products. The relevant Network Rail Technical Head or delegate who owns an asset category will assign a Lead Reviewing Engineer to a product. The Lead Reviewing Engineer will then provide a set of technical requirements (This is different to initial generic product requirements which should be supplied to a potential supplier by a NR Engineer much earlier) to the Network Rail applicant, so that the manufacturer can then provide evidence back to meet those requirements. The Lead Reviewing Engineers also assess requested Design for Reliability (DFR) evidence, see the DFR section in this document for further information.

For Plant assets (i.e. On Track Plant, On Track Machines and tools) Plant Assessment Bodies who have been delegated by the Network Technical Head, can also undertake technical reviews on Network Rail's behalf.

Q13 – Is there anybody external to NR who can technically assess products?

For Plant assets (i.e. On Track Plant, On Track Machines and tools), Plant Assessment Bodies who have been delegated by the Network Technical Head can also undertake technical reviews on Network Rail's behalf.

Q14 – Do you approve Rolling Stock?

No, most rolling stock is owned or leased by Train Operating Companies (TOCs) and therefore falls under the responsibilities of the owners and does not fall within the scope of products that require Product Acceptance. However, if a piece of plant is specifically designed for Network Rail and hired, this does not exclude them from the need to gain acceptance.

Q15 – I have approval for my Product for use on another or similar infrastructure, does that automatically give me approval on NR infrastructure?

No. Unfortunately, although there are some similarities between Infrastructures, there are differences in safety regulations and standards. There are also differences in technologies and systems used and installed on the different Infrastructures and other considerations such as line speeds and loading gauges.

Q16 – What is a Product Acceptance certificate?

Product Acceptance certificates are documents that are issued when a product has successfully completed the Product Acceptance and Design for Reliability (if required) processes (full certificate), or for those products that have met technical requirements that require a trial on the operational infrastructure (trial certificate). The document is endorsed by the relevant Network Technical Head or delegate and includes details of:

- The Product and manufacturer of the product.
- The scope of approval, including how and where the product can be used.
- Any user and manufacturer conditions that relate to the products use or installation.
- Trial conditions and limitations (on trial certification)

- A list of items that make up the configuration of the product or system.

Certificates are issued with a unique reference number beginning ‘PA05/’ followed by five numeric digits eg PA05/01234, all correspondence relating to a product should reference the PA05/ number.

Q17 – How do I obtain a Product Acceptance certificate for my product?

Product Acceptance certification is issued when any technical requirements that have been set by the designated Lead Reviewing Engineer, and those associated with Design for Reliability have been met.

Items that require a trial on the operational infrastructure will require “Trial Certification”. This will also be issued when the Lead Reviewing Engineer has clarified that any technical requirements have been met or identified risks have been mitigated.

Q18 – Can I trial my product on the live Infrastructure?

Yes, but only when you have been issued with an endorsed Trial Certificate. Trial on the live operational infrastructure should only be considered if trials cannot be conducted in off-infrastructure environments.

Q19 – What is a Trial Certificate?

A trial certificate provides authority to trial a product or system on the operational infrastructure. Trial certificates are time bound and include specific trial conditions that must be met prior to full Product Acceptance being granted. Trial certificates are normally also restricted to geographic areas, the number of items that can be trialled and to the number of worksites that can be used during a trial.

Q20 – When can I obtain a Trial Certificate?

Trial certification is issued once evidence has been submitted against technical requirements set by the relevant Lead Reviewing Engineer, from within Network Rail’s Technical Authority or a Plant Assessment Body. The Lead Reviewing Engineer will review the submitted evidence and determine whether a trial will be required to fully meet those requirements or to mitigate any outstanding risks.

Q21 – Is there anywhere else that I can trial a product?

There are quite a few facilities where trials can be conducted off the Operational Infrastructure, these include test tracks such as the Rail Innovation Development Centres (RIDC) and the Rail Alliance facility at Long Marston, as well as Heritage Railway sites, depots and laboratories. All possible testing should be carried out at Off-Infrastructure facilities prior to submission of a product or system for Product Acceptance assessment. Trial Product Acceptance certification is not required for testing within these environments.

Q22 - Can I obtain temporary Product Acceptance?

No, there is no such category of Product Acceptance.

Q23 - Is this process PADS approval?

No, there is no such process as PADS approval. PADS (Parts and Drawings database) is a repository for catalogue numbers owned and managed by SERCO. The majority of the items that have catalogue numbers within PADS have received Product Acceptance, however, there are some assets contained that do not require PA such as civils coatings and those that had Grandfather Rights status that were in use prior to the existence of Product Acceptance.

Q24 – What technical requirements will I need to meet before gaining Product Acceptance?

This depends on the type and complexity of the product or product change. Some assets, such as those associated with advanced signalling or electrification systems are likely to require assessment against a multitude of technical requirements defined by national, industry and Network Rail standards and specifications, whereas relatively simple or lower risk products or changes to products are unlikely to require the same level of scrutiny.

The relevant Technical Authority Lead Reviewing Engineer will ascertain which technical requirements apply on receipt of the initial information supplied when an application is submitted. It is advisable to submit as much technical data as possible when applying to assist in determining which technical requirements apply.

It is also worth noting that the Design for Reliability (DFR) process applies to most items that require Product Acceptance. The requirements associated with DFR can be found in Network Rail Standard NR/L2/RSE/0005.

Q25 – How long does the Product Acceptance process take?

This depends on the type and complexity of the product or product change. Some assets, such as those associated with advanced signalling or electrification systems are likely to take longer due to the evidence required to meet technical requirements, whereas relatively simple or lower risk products or changes to products are unlikely to take as long.

Approximately 80% of compliant new or change request applications reach certification within 40 working days. However, it is recognised that approximately 20% of applications are for complicated products that will take much longer to assess.

Q26 – What normally “holds up” items navigating the Product Acceptance Process?

Items normally take longer to navigate the Product Acceptance for the following reasons:

- Awaiting evidence against technical requirements set by the relevant Technical Authority Lead Reviewing Engineer.
- The requirements of the Design for Reliability standard NR/L2/RSE/0005 required prior to Product Acceptance have not been met.
- The product requires redesigning to meet requirements.
- The Network Rail applicant withdraws sponsorship.

- The product has been applied for too early within the product management lifecycle prior to meeting the required entry level Technology and Reliability readiness levels.

Q27 – Can I obtain a PADS number for my product without gaining Product Acceptance?

Only for assets that do not require Product Acceptance such as civils coatings.

Q28 – What happens if I change my product?

If make a change to an approved product that alters the scope, conditions or configuration as defined on the Product Acceptance certificate you will need to submit a change application via our online form located here: https://www.networkrail.co.uk/industry-and-commercial/research-development-and-technology/product-acceptance/product-acceptance-form/.

If you are unsure whether your intended change requires further assessment via Product Acceptance please contact us at prodacc@networkrail.co.uk.

Q29 – What happens if I need to use or install my product outside the scope of my Product Acceptance certificate?

If make a change to an approved product that alters the scope, conditions or configuration as defined on the Product Acceptance certificate you will need to submit a change application via our online form located here: https://www.networkrail.co.uk/industry-and-commercial/research-development-and-technology/product-acceptance/product-acceptance-form/.

If you are unsure whether your intended change requires further assessment via Product Acceptance please contact us at prodacc@networkrail.co.uk.

Q30 – What is a Trial Expiry date?

Trial certification is time limited to make sure trials are conducted in a reasonable time frame.

Q31 – What happens if my Product Acceptance certificate expires?

Your trial certificate may include an expiry date which limits the duration of the trial, trial certificates will become invalid if the expiry date has been exceeded.

Q32 - What is a Trial Monitoring period?

Your trial certificate may include a monitoring period which limits the duration of the trial to ensure that the trial is conducted within a reasonable time frame.

Q33 – What happens if my Trial Certificate Monitoring period has passed?

Permission from the relevant Network Technical Head must be obtained to continue the trial if the monitoring period has been exceeded. Items that have not received permission and been recertificated will need to be removed from the infrastructure.

Q34 – Who manages the Trials on the operational Infrastructure?

The Network Rail Route or Project requiring the product will normally conduct the trial. The sponsoring Network Rail applicant is responsible for coordinating the trial and for collating the trial output, as required within the certification trial conditions.

Q35 – How many items can I trial on the operational infrastructure?

In most cases trials should be limited to no more than four items. Permission must be granted by Network Rail Assurance Panel (NRAP) to exceed this number.

Up to ten items may be permitted to be trialled if they relate to variable gauge R&R studies, or twenty for discrete R&R studies, as required by the Design for Reliability process.

Q36 – Do civils items need Product Acceptance?

Most civils assets do not fall within the scope of Product Acceptance. Exceptions include drainage products that are required to be installed under tracks.

Q37 – How do I obtain a catalogue number for a civils coating?

PADS numbers can be obtained for civils coatings by contacting cataloguequeries@networkrail.co.uk. A valid coatings test house certificate must be submitted before a catalogue number is issued.

Q38 – Does worksite lighting require Product Acceptance?

In most cases no. However, if the item is particularly heavy and does not have wheels fitted it may require assessment to meet ergonomic requirements.

Q39 – Do assets within a station concourse need Product Acceptance?

Most assets within a station do not require Product Acceptance as they are not linked to the operational infrastructure. Examples of these include customer information screens and help points, station surveillance systems, ticketing systems, escalators, lifts and lighting.

The exception to this rule is for sub-surface stations (category 12) as there are additional risks that require mitigation within these environments such as those relating to fire.

Q40 – Do items on a station platform need Product Acceptance?

Most items installed or used on station platforms do not require Product Acceptance unless there are links to operational equipment or systems, or there is a risk of fouling the infrastructure or other assets, for example with Plant machinery.

Q41 – Do items within a depot require Product Acceptance?

Most items within depots do not require Product Acceptance apart from products associated with electrification that is linked to the operational infrastructure electrification systems.

Q42 – Do I need Product Acceptance to trial my item at the Rail Innovation Development Centres (RIDC)?

No, the RIDC's and other off-infrastructure test facilities are not considered part of the live mainline operational infrastructure. RIDC management will advise on any assurance requirements that apply to the use of their facility, including any risk assessments.

Q43 – What records are kept on file for Product Acceptance applications?

The following documentation is usually kept on file for all applications:

- All evidence that is collected from manufacturers in relation to technical requirements.
- Correspondence relating to the application.
- The application form.
- Trial critical review reports and other evidence collated during a trial.
- Copies of certification awarded during the process.

Q44 – How do I find out what products have already gained approval?

The industry PADSnet database houses all items that have been either granted Product Acceptance or have "Grandfather Rights" status and were used prior to the introduction of Product Acceptance. All will be listed as "controlled" items and can be found here: https://www.padsnet.co.uk/logon.aspx?ReturnUrl=%2f.

Network Rail employees can also search for products via the internal istore system here: https://ebsprodnwrl.omcs.networkrail.co.uk/OA_HTML/ibeCCtpSctDspRte.jsp?section=10021&sitex=10020:22372:US. Network Rail employees can obtain login access to the PADSnet database by contacting cataloguequeries@networkrail.co.uk.

Network Rail employees can also search for products via the Product Acceptance HUB site here: https://productacc.hub.networkrail.co.uk/Pages/NRHome.aspx.

Q45 – How do I obtain certificates for Products that have been approved?

The majority of products listed in the PADSnet system will include a link to the Product Acceptance certificate, you can access PADSnet here: https://www.padsnet.co.uk/logon.aspx?ReturnUrl=%2f

Network Rail employees can also search for certificates via the Product Acceptance HUB site here: https://productacc.hub.networkrail.co.uk/Pages/NRHome.aspx.

If you cannot find the certificate you are looking for please contact us at: **prodacc@networkrail.co.uk**.

Q46 – What happens if my company changes name?

Changes in company name shall be advised by the manufacturer to the Product Acceptance Process team in writing at prodacc@networkrail.co.uk.

The manufacturer will need to provide evidence that there is no change to:

a) the manufacturing site;
b) patents;
c) design authority;
d) skill base;
e) tooling;
f) fitness for purpose;
g) safety integrity;
h) reliability.

These risks are non-exhaustive and additional evidence may be requested by the Network Technical Head of Asset discipline or delegate.

The Network Technical Head of Asset discipline or delegate shall approve or decline the request.

The Product Acceptance Process Specialist and Catalogue Management team will amend all necessary records and issue certification if required* for new products.

**NOTE: Certificates should reflect the name of the manufacturer at the time of approval, therefore certification is not normally amended with new manufacturer details for items that have already been approved. Certification also no longer includes addresses.*

Q47 – What happens if my company changes location?

Product acceptance cannot be transferred between manufacturers, manufacturing sites, or countries unless approved by the Network Rail Network Technical Head of Asset discipline or delegate.
To gain approval for transfer, the outgoing manufacturer shall provide supporting evidence in writing to prodacc@networkrail.co.uk.
The Network Rail, Technical Head of Asset discipline or delegate will then review the evidence provided.
The supporting evidence must include the following:

a) the transfer of patents;
b) design authority;
c) skill base;
d) tooling;
e) fitness for purpose;
f) safety integrity;
g) reliability;
h) processes for assuring the competence of the workforce required to operate or maintain the product.

These risks are non-exhaustive and additional evidence may be requested by the Network Technical Head of Asset discipline or delegate.
The Network Technical Head of Asset discipline or delegate shall approve or decline the request.
The Product Acceptance Process Specialist shall amend all necessary records and issue certification as directed if required.

Q48 – What are Initial Generic Requirements?

There are some requirements that relate to the majority of products e.g. General Arrangement and other drawings, configuration details, details of declarations of conformity and quality management requirements. As this information is required for most products a list is provided early during our process, so that the manufacturer can start collating the data in advance of product specific requirements.

Initial Generic Requirements are provided after a product has been allocated a PA05/ Product Acceptance reference number in our system.

Q49 – What are Product Specific Technical Requirements?

The appointed Lead Reviewer specifies technical requirements specific to the product under consideration. These normally relate to requirements that meet technical specifications and/ or NR and/ or Industry standards.

Q50 – What is a Plant Assessment Body (PAB)?

Plant Assessment Bodies are organisations external to Network Rail who have been authorised by to NR Network Technical Head of Plant to undertake the Product Acceptance Technical review of Plant assets on Network Rail's behalf.

This entails an assessment against technical acceptance requirements as agreed with the NR Network Technical Head and as per the current process. After successful completion of an assessment by the PAB, the NR Network Technical Head of Plants' team will agree on the outcomes and endorse any resulting certification prior to issue by the NR Product Acceptance team.

Q51 – How do I engage with a PAB?

Manufacturers and suppliers are now able to apply direct to one of the Plant Assessment Bodies (PABs) for Product Acceptance assessment of items of plant equipment. This will then be conducted in line with the relevant PAB commercial arrangements and pricing structure.

Contact details for PAB's can be provided by contacting us at prodacc@networkrail.co.uk.

Please note that Plant refers to assets such as On Track Plant, On Track Machines, tools etc and does not include electrification assets.

Q52 – Does my product need sponsoring by an NR Applicant if being assessed by a PAB?

No

Q53 – Is the PAB assessment route quicker?

The speed of assessment will depend of the workload of the individual PAB. However, as there are multiple PAB organisations it is likely that assessment will be quicker than it was when all Plant assets were assessed in-house only by Network Rail. The PAB's will be able to advise on individual timescales when you contact them.

Q54 – What is meant by "Grandfather Rights"?

The term "Grandfather Rights" refers to products that do not require Product Acceptance because they are legacy items that were in use prior to the existence of Product Acceptance.

Q55 – What happens if I change a product that has "Grandfather Rights"?

If you wish to change a product that holds "Grandfather Rights" status it will need to be assessed via Product Acceptance, as it will no longer retain the characteristics it had when originally used.

2. SYSTEM REVIEW PANEL (SRP)

Q1 – What is System Review Panel?

System Review Panel is where complicated, multidisciplinary products, projects or systems will be assessed by a group of engineering disciplines and/or relevant experts to make sure all risks have been addressed adequately before introducing the product onto Network Rail Infrastructure.

Q2 – How do I apply for my product or system to attend a System Review Panel?

We have an online application form which you can access here: https://www.networkrail.co.uk/industry-and-commercial/research-development-and-technology/product-acceptance/product-acceptance-form/.

You will need to clarify within the form that you are requesting review by an SRP.

Q3 – Why should I need to attend a System Review Panel?

If the product is seen as being part of an infrastructure project, is complicated or needing more than one expert or engineer to assess it; and this decision can be made by the Technical Authority Network Technical Head; Engineering expert/reviewer or NRAP.

An application for product acceptance could be directed to SRP or a project attendance to NRAP could be directed to SRP.

Q4 – Which System Review Panel should I attend?

The SRP's are split up by engineering discipline and Region; consultation with NRAP, Network Technical Head, Engineering expert/Reviewer or The Product Acceptance Team Prodacc@networkrail.co.uk will help to determine the best direction to go in if SRP is indicated as a place where your product or project will be reviewed.

3. DESIGN FOR RELIABILITY (DFR)

Q1 – What is DFR?

DFR is a structured procedure identifying minimum requirements for suppliers to demonstrate that they have designed reliability into new or changed controlled products and addressed potential reliability risks using documented outputs from proven tools.

It was mandated from 3/4/2017 by Network Rail's Business Process NR/L2/RSE/0005, first issued in June 2016.

DFR was designed to address causes of unreliability, whilst also considering whole life cost. We expect our suppliers to demonstrate use of DFR tools when submitting items for Product Acceptance (PA) and during supplier selection and we put greater emphasis on sharing causes of historic failures with suppliers. When applied to product changes, it expects the most appropriate methods to be used to confirm that correct cause/s are identified and addressed.

DFR adds a reliability element to the legal and safety elements of PA. Although DFR focuses on reliability, it also assists safety, as reliability products need less manual intervention and eliminate both safety and non-safety-related failures.

DFR is split into 11 Reliability Readiness Levels with most being possible before a physical prototype is made. This is followed by testing away from the operational railway under conditions representing a thorough list of factors from the real world, with attention to interactions with other systems. The final activities, after PA, occur on the operational railway. DFR places increased early emphasis on installation processes, suitability of measurement devices and maintenance regimes during the design process, where it is cheaper and quicker to address potential risks. Clear evidence of how our requirements are prioritised to become design features, process parameters and ultimately process controls is also required.

Q2 – Is every DFR step always needed?

A lot of effort has gone into making the DFR standard one of the most 'flexible' that exist in NR. Much of the standard consists of explaining when elements do not need to be undertaken and there would be a fraction of the current number of pages if it were just an inflexible one size fits all process to be applied the same way in all circumstances.

Different paths through DFR (Identified by codes such as D3, K1, E3, etc.) are stated depending upon whether it is a new product, revised products, designed prior to any Network Rail involvement, just a supplier relocation, changing supplier, perceived level of potential risk, the consequence of any failures, low volumes, the product being a piece of measurement

equipment and the extent of a change. If a product was designed using DFR and a subsequent change is made, this has a very cut down path where the evidence is just revisited and updated. Each path is described in the DFR standard NR/L2/RSE/0005 and may allow steps to be omitted or conducted in a simpler manner.

Many paths also give flexibility to the Lead Reviewer and these situations are clearly identified in the DFR standard.

Q3 – Where can I get the DFR standard?

Internal NR staff can access the latest version of the standard at:

http://networkrailstandards/NewSearch.aspx?q=nr/l2/rse/0005

There is now a process for Network Rail Suppliers to obtain Network Rail standards for free. Details are available by emailing DFR@networkrail.co.uk.

Q4 – Why have NR introduced DFR?

DFR is a proactive element of Structured Continuous Improvement, introduced because, although delay minutes had gradually improved since 2000/2001, they had plateaued at 8,000,000 minutes per year, with a recent slight rise due to greater delay per incident.

This lack of improvement was because reliability effort was purely focussing on fixing issues after products were introduced, rather than using reliability tools that have been used for decades in other industries. This meant that by the time an issue was resolved a new issued had been introduced to take its place.

As products are introduced using DFR, we expect less repetition of past issues, more effective installation processes, less asset related train delay and lower whole life cost.

Q5 – What products need DFR?

All products seeking PA that require engineering assessment from NR, or a Plant Assessment Body (PAB). It applies to existing and potential suppliers, and NR staff in departments including Engineering, Procurement, Supplier Quality Assurance (SQA), Reliability and Product Acceptance. It covers new and changed rail infrastructure products, systems, sub-systems, measurement equipment, materials, On-Track Machines and ‘rail specific parts’ of On-Track Plant entering the PA process. However, it is not mandated for On-Track Plant that was both designed prior to NR involvement and will be ‘hired’, rather than purchased by NR, although it is recommended that this should follow the process where possible.

It also applies to products for use in new applications, with changes in product requirements and existing products sourced from new suppliers. It applies in a limited form when a supplier relocates their premises, or a product with an unchanged design is to be manufactured by a new supplier.

DFR is not mandated for PA requests exclusively covering new software or software changes, as demonstrating reliability of software typically requires different approaches to physical

products. It does, however, apply to any new or changed hardware related to, or containing such software. The lack of inclusion of software, does not reduce the need to continue to apply appropriate methods to the same extent as was expected prior to the introduction of DFR.

In line with the Railways (Interoperability) Regulations 2011, any additional tests or requirements that are already defined in the TSI, do not apply and the assessor should request the certification instead, or ask the potential supplier to demonstrate they have met the essential requirements.

DFR was mandated from 3/4/2017 and is not expected to be gained for products that were already approved for use before that date. However, once those products are replaced or modified, such that they trigger PA, DFR is then required. Projects that had formally completed GRIP 3 on 3/4/2017, continue to comply with standards that were in place at the point that GRIP 3 was completed.

Q6 – How do I demonstrate that DFR has been correctly applied?

The supplier should add evidence against each relevant numbered step within the DFR evidence pack (that can be obtained by a NR contact downloading it from the DFR Yammer page, from the One Drive link given to attendees on the DFR course or by emailing DFR@networkrail.co.uk) as they progress through the design process. The pack shows some example evidence for the case study used on the DFR training course and should be replaced with the actual evidence. If any steps do not apply, do not remove them, but instead state the reason that the DFR standard, NR/L2/RSE/0005 allows it to be omitted. E.g. “The product has no manual operating process” for step 8.2.4.

The pack should be added as an attachment when the Sponsor or PAB makes a formal application for PA and is assessed by the PA Lead Reviewer or the PAB.

Q7 – How can I get help to apply DFR?

Suppliers and NR staff can request training at DFR@Networkrail.co.uk. There is a 3-day classroom introduction course which is also available as a 5-day webinar covering how to select the path through the process, how to apply each step and how to submit DFR evidence. It includes a railway example throughout, with exercises and interaction. Advanced modules are also being developed and launched on key tools used within the DFR process.

A link to a 15 minute video giving high level awareness of the DFR process can be obtained by emailing DFR@Networkrail.co.uk .

We have some staff that have been trained in some of the key DFR tools who can help by contacting DFR@Networkrail.co.uk . A project code needs to be provided to cover their costs.

Once you have a NR applicant prepared to act in a sponsorship capacity who can demonstrate a NR business need for the product/change, you can confirm that NR may potentially be interested, discover the required path through DFR, the PA Lead Reviewer, an engineering contact and the PA number for the application by submitting a preliminary PA submission stating ‘DFR enquiry’ in the ‘Business Case’ field at https://www.networkrail.co.uk/product-acceptance.

Q8– I don't have a sponsor within NR. How can I engage with Network Rail to find one?

If you have already been selected to supply NR as part of a procurement exercise, you will have a contractor's rep documented at contract award and for supplier led changes sponsors typically sit in contracts and procurement.

Network Rail will be particularly interested to engage with a supplier if they are working on a product that addresses a Challenge Statement as listed at https://www.networkrail.co.uk/industry-and-commercial/research-development-and-technology/research-and-development-programme/challenge-statements/ in which case they can contact NR at **R&D@networkrail.co.uk**.

Small and Medium-sized Enterprises have regional champions and these can be obtained by contacting DFR@Networkrail.co.uk.

Non-SME contacts are in columns K & L of the 'Consolidation' tab within the spreadsheet reached from the 'procurement pipeline' link at: https://www.networkrail.co.uk/industry-and-commercial/supply-chain/procurement/

A good way to gain contacts within the rail industry is via organisations that support rail suppliers such as the Rail Industry Association (RIA), Rail Alliance, Civil Engineering Contractor's Association (CECA), Rail Forum Midlands (RfM) & the Rail Industry Contractors Association (RICA).

Suppliers can make general enquiries at: https://www.networkrail.co.uk/procurement-service-centre-request/

Sponsors must be placed to set requirements and to possibly trial where necessary. General staff in admin roles or storemen, etc. cannot be sponsors. Sponsors are informed when an application for PA is made in their name.

Q9 – Doesn't this make rail products more expensive?

No, it is the opposite. We spend a large amount of money every year sending staff to site to fix issues. They also must buy spare parts to replace faulty items. In addition, when NR are responsible for delaying a train, they must make contractual Schedule 8 payments to train operators as compensation. In 2017/18, the gross cost of Schedule 8 payments alone for failures of track, signalling, electrification and telecom was £322M. The average cost of a single delay due to a railway relay failing was £8,246.

Q10 – How long does it take to apply DFR?

There is not one single answer to this. It depends upon what path you need to follow through DFR, what the impact level is based upon potential effects of product failure, how simple your product

is and how much resource you allocate to doing DFR. There may also be certain steps that don't apply for your product, such as requiring no manual intervention during use and hence not needing the creation of an operating process flowchart.

An analysis was carried out in the early days of DFR by estimating times for each step in the DFR process and averaging all the different paths through the process. A generous hourly rate was applied and the average cost of applying DFR was found to be less than just the Schedule 8 element of the cost associated with a single failure of a typical railway component.

A critical path diagram has been created to allow a team applying DFR to calculate a duration and to see where the bottlenecks are likely to be (often testing, as this takes a while due to its very nature and is not something new as a result of DFR). This has also been turned into a Gantt chart for inclusion in project and programme plans.

Q11 – Who does the work to apply DFR?

Most of the steps are carried out by the supplier to NR, as they are designing the product. However, part of the process is to specify what is required and this is done by Network rail (The Customer) at the very start of the process). NR also conduct the steps where the product is procured and assessed for Product Acceptance (Although in some cases this may be done externally by a Plant Acceptance Body).

Q12 – As a supplier, how do I recoup my costs of applying DFR?

DFR is part of modern good practice when designing a reliable product and is no different to any of the other activities carried out to get a product to market. Therefore, a supplier recoups it along with other design costs when they start to sell their product.

Q13 – Are small suppliers excluded from having to do DFR?

Whilst NR wish to encourage suppliers of all sizes, lack of resource is not an acceptable reason to avoid applying tools to give us confidence that a product will be reliable. It would also be unfair on larger suppliers to have lower expectations of small company. Small companies can deal with applying DFR by engaging a consultant with the required skills or teaming up with another company that does have the required resource.

Q14 – What benefits have you measured from DFR?

DFR is a prevention process, and so it avoids failures in the first place rather than allowing them to happen and then resolving them.

Whilst it is easy to measure the benefit of fixing a problem, it is much less efficient at improving the railway. Prevention is impossible to measure (without the use of a time machine and designing something both 'with' and 'without' DFR), but has much greater benefits, as we never experience the issue at all, it is cheaper to make things better earlier in the process and we don't have to spend money investigating the failure. I asked our asset data team if they still see specific

examples of the type of product failures that DFR was introduced to avoid and they said they could not think of any similar examples, since DFR has become established.

Unfortunately, human nature tends to be that people who react, and fight fires are recognised and praised whereas those who put the effort in to avoid an issue go unnoticed!

Hence it is excellent that the need for such prevention work is now recognised at senior levels within NR. When gaining approval for the funding for the advanced DFR courses, our Route customers who increasingly decide what is important for NR totally recognised this and agreed that there was no need to attempt to measure it, as that would be a futile exercise.

We have some specific examples where we know DFR has avoided issues. Some of these relate to gauge R&R (Repeatability and Reproducibility) studies where several suppliers were about to use measurement systems that would not have been able to differentiate between 'OK parts' and 'NOK parts' and the insistence of DFR that gauge R&R is applied, led them to discover this and to implement a system that could correctly measure them.

The other point to note is that the overall level of train delay is also not a suitable measure, as it is affected by so many other factors such as the level of traffic, the level of innovation, new lines opening etc. It would be very unfair to quote a reduced train delay figure after a year of Covid-19 and suggest it was due to DFR, in the same way that an increase in delay after a rise in traffic should not be used to claim the opposite. Our data systems for recording asset failures are also not detailed enough to analyse this on a product by product basis and would take so much manual work that this would not be a sensible exercise.

Q15 – If I have an excellent history of reliability that I can tell you about, can I skip DFR?

That is insufficient, as past performance is not a guarantee of future performance of new or revised products. Unstructured, anecdotal, evidence is also not consistent and auditable across products and suppliers.

Q16 – My product is very inexpensive. Does that exclude me from DFR?

No. The unit cost of a product has no bearing upon its reliability risk and a component costing a few pence could cause massive train delays and related cost to resolve an issue. In fact if the reason a product is cheap is due to the lack of application of good engineering and reliability practices then the product is in greater need of DFR.

Q17 – I am not planning to make many of this item. Does that exclude me from DFR?

It does not totally exclude you, but there is a reduced, more flexible path through DFR explained in clause 11.1 of the DFR standard where fewer than 10 products are expected to be made. Note that this limit will be stated on the PA certificate and if you then wish to make more, you will need to cover any activity that was previously excluded. When applied at a later time, the activities still takes as long to complete but are not as cost effective to react to, so if you are unsure how many

you will sell, you may decide that it is best to just do the additional elements to retain future flexibility.

Q18 – My product has already been designed; can I skip DFR?

DFR is mandated, to some degree, for all controlled products requiring PA, including those that are already designed.

However, products that are already designed prior to any NR involvement (i.e. they are not designed specifically for NR and have already been used elsewhere and do not need to be modified) are allowed to follow a reduced path such as paths E1, E2 or E3. This reduced path is not acceptable if the product is already designed due to consideration of DFR being left too late.)

We do not allow suppliers to avoid DFR by designing something for NR in isolation and then springing it on us, as that avoids one of the key elements of DFR which is to confirm that the stated requirements of the product meet NR's needs prior to any time and money being put into designing it.

Q19 – I see no reason for ANY DFR steps when applying PA to my product, can I skip it?

If a product needs PA, then it always needs some level of DFR, as it includes some very basic steps. It would be unreasonable to approve any product without step 8.1.4 stating NR's product requirements. We expect that a documented manufacturing process exists at step 8.5.1 and would be concerned if any supplier manufactured a product without this.

Particularly important is proof that any measurement of important parameters during manufacture, by the product itself or by any installation gauges (if used) reflect the dimension being measured, which are done at steps 8.5.4, 8.6.1 and 8.9.2. This is fundamental, as there is no point measuring something if the result cannot be trusted. Incorrect measurements may be worse than no measurement, as it can suggest a defective item is OK or may lead to the scrapping or rework of OK items. Before DFR we tended to request calibration data for measurement devices, but tended not to request gauge repeatability and reproducibility studies that now show that if someone re-measures an item, they get a similar result and that different people get the same result. This is important as many measurement systems are affected by how they are used.

Q20 – I think I can see a more effective way of applying DFR, can I influence the standard?

Absolutely. We welcome any suggestions for improvement, and we are on a much-improved 5th version of the standard thanks to input from prior users and attendees on the training with specific regard to Commercial / Configurable Off the Shelf (COTS) Products.

However, this cannot just be a statement that the process adds work. It will always be quicker in the short term to produce an item with no thought for reliability than to design it in. But long term that approach is inefficient.

Feedback should therefore state any specific situation in which the DFR standard requests something to be done that adds insufficient value for the benefit gained.

A specific situation needs to be described and why the activity does not add value in that situation. If there is a valid point, the standard will be revised.

Note that DFR is in place for the benefit of the passenger and taxpayer via benefit to Network Rail, but in order to gain the benefit it is the supplier that needs to do most of the additional activity.

There is also a more formal process that allows any stakeholders to easily challenge any Network Rail standard. External parties can use the application form at https://www.networkrail.co.uk/wp-content/uploads/2016/11/Standards-Challenge-Form-Version-1.docx with guidance at https://www.networkrail.co.uk/wp-content/uploads/2018/03/Guidance-for-Completing-the-Standards-Challenge-Application.pdf . NR staff should contact the standard and control document owner shown for the standard on the NR standards website. Further advice is available at standardsmanagement@networkrail.co.uk .

Q21 – I have ISO9000, can I skip applying DFR?

ISO9000 does not remove the need for DFR. These two assessments look at different things. ISO9000 looks to see if a supplier has a documented Quality Management Process in place and that they follow it. DFR has specific expectations of what activities we expect to see in order to avoid reliability issues.

Q22 – We follow BS EN50126, can we skip applying DFR?

BS EN50126 describes the types of activity that we expect to see at a very high level. It is met by following a specific process of the type outlined by the DFR process NR/L2/RSE/0005. So DFR is the how, to BS EN50126's 'what'. BS EN50126 was an expectation long before DFR was introduced and at PA we just tended to be presented with extremely variable approaches that tended to mainly consist of calculations of an estimated mean time between failure (although this was not always present and often calculation errors). There was little in the way of evidence to show what had been done in terms of listing potential ways in which the product may fail, prioritising these and avoiding them. Hence why we needed DFR to clarify our minimum expectations. When version 1 of the DFR standard was created, it was cross checked to BS EN50126 to make sure that there were no conflicting expectations and to make DFR a means to achieve BS EN50126.

Q23 – We do DFR already, can you check our process rather than every product?

We have a process in place that allows a supplier's design process to be assessed rather than expecting evidence on a product by product basis. This is self-funding, so there is a fee. Both assessment processes will co-exist.

This is not an easier path as suppliers must show that the requirements of DFR are applied consistently to all products to be used by NR. However, it may be a more effective approach for suppliers that regularly seek PA from NR.

Any interested supplier should email NCBEnquiries@networkrail.co.uk. No NR user involvement is expected during the audit, as it is up to the supplier alone to convince an assessor that they meet the requirements of the DFR process.

If awarded, the certificate may be accepted at PA in lieu of the DFR evidence for a period of 2 years unless the supplier has a major reorganisation, changes their Quality Management System is changed, moves location, is sold or the certificate is removed due to poor performance.

The supplier should state a date on which they believe their design process was compliant and this sets both the scope of evidence to be audited and of the products that the certificate will cover. The supplier can seek a reduced certificate to cover specific paths through the DFR process.

Q24 – Can you recommend a consultant to assist us to apply DFR?

Unfortunately, not. As a NR employee, I am not allowed to give such an advantage to a particular consultancy.

We have some people within NR that can be contacted via DFR @networkrail.co.uk who can assist with various steps of the DFR process. They do require a budget code from a project in order to be able to assist.

Attending the DFR introduction course and reading the standard should help you ask the right questions of a potential consultant to see if they understand DFR.

Q25 – I have a question not covered in the FAQ. Can you answer it?

Check the latest version of the DFR standard 'NR/L2/RSE/0005' and if the answer is not there, please send your question to 'DFR @networkrail.co.uk

4. CATALOGUE NUMBERS

Q1 – Which catalogues house items that have been through Product Acceptance?

The industry PADSnet database houses all items that have been either granted Product Acceptance or have "Grandfather Rights" status and were used prior to the introduction of Product Acceptance. All will be listed as "controlled" items and can be found here: https://www.padsnet.co.uk/logon.aspx?ReturnUrl=%2f.

Network Rail employees can also search for products via the internal istore system here: https://ebsprodnwrl.omcs.networkrail.co.uk/OA_HTML/ibeCCtpSctDspRte.jsp?section=10021&sitex=10020:22372:US.

Q2 – Who manages the catalogues?

SERCO manage the PADSnet system

Network Rail Route Services manages the internal istore system

The Network Rail Route Services Catalogue Management team manages the input of product catalogue numbers into the two systems.

Q3 – How do I get access to the catalogues?

For PADSnet, Network Rail employees can contact cataloguequeries@networkrail.co.uk. Non Network Rail persons/organisations need to contact SERCO to subscribe to the system: https://www.padsnet.co.uk/logon.aspx?ReturnUrl=%2f

Network Rail employees can access the istore system direct here: https://ebsprodnwrl.omcs.networkrail.co.uk/OA_HTML/ibeCCtpSctDspRte.jsp?section=10021&sitex=10020:22372:US

Q4 – Who manages the catalogue number allocation?

The Network Rail Route Services Catalogue Management team manages the allocation of catalogue numbers and can be contacted at cataloguequeries@networkrail.co.uk.

Q5 – Who should I contact if I have a query relating to a catalogue number?

You can contact the Network Rail Catalogue Management team at cataloguequeries@networkrail.co.uk

Q6 – What is a "Controlled" catalogue number?

"Controlled" refers to catalogue numbers for which Network Rail Engineering asserts control. For any items falling into this category, it is mandatory that the product acceptance process is followed as explained in the Network Rail standard **NR/L2/RSE/100/05**.

Q7 – What is an "Uncontrolled" catalogue number?

"Uncontrolled" refers to catalogue numbers for which Network Rail Engineering asserts no control. Products in this category are low risk items that **do not** require acceptance. The issuing of uncontrolled numbers is managed by the Network Rail Catalogue Management Team within Route Services.

5. STANDARDS

Q1 – Which Network Rail Standards apply to Product Acceptance

NR/L2/RSE/100/05 Product acceptance and change to Network Rail operational infrastructure

NR/L2/RSE/100/07 System Review Panels

NR/L2/RSE/0005 Design for Reliability

Q2 – How do I obtain copies of Standards

Network Rail personnel can access the standards catalogue here: http://networkrailstandards/index.aspx

External parties can register to access NR standards for free: at:https://global.ihs.com/csf_home.cfm?&csf=NR

6. PRODUCT DEVELOPMENT FRAMEWORK (PDF)

Q1 - What is PDF Panel and why would I need to attend?

Product Development Framework Panel can help and direct early development projects, often funded through research and development initiatives through the Rail Industry Readiness Levels (RIRL) Framework. Projects will often be at RIRL 5 or below if attendance to PDF panel is required; projects may be planning to deliver new products, systems, processes or a combination of all of these.

The Panel is made up of experts from Research and Development, Routes, product acceptance, I.T. contracts and procurements, engineering and reliability; the panel aims to help and advice on the direction of the project so that all these important business areas have been considered by the project; further guidance can be sought via Prodacc@networkrail.co.uk.

7. NETWORK RAIL ASSURANCE PANEL (NRAP)

Q1 – What is Network Rail Assurance Panel?

Network Rail Assurance Panel (NRAP) governs several Network Rail processes on behalf of Network Rail's Executive. These processes help Network Rail comply with its statutory responsibilities and Health and Safety Management System when a change is introduced that could change the risk profile of Network Rail Infrastructure.

NRAP governs several processes that provide appropriate review prior to projects, products and vehicles being brought into service.

Q1 – What processes do NRAP Govern?

The following is a list of processes and their standard numbers that are governed by NRAP:

NR/L2/RSE/100/01 Network Rail Assurance Panel

NR/L2/RSE/100/02 Application of the Common Safety Method for Risk Evaluation and Assessment

NR/L2/RSE/100/03 The application of the interoperability regulations for infrastructure projects

NR/L2/RSE/100/04 Introduction of new or modified vehicles

NR/L2/RSE/100/05 Product acceptance and change to Network Rail operational infrastructure

NR/L2/RSE/100/07 System Review Panels