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NIA Project Registration and PEA Document

Date of Submission

Jul 2026

Project Reference Number

NGED_NIA_091

Project Registration

Project Title

PMT Scan - Condition Monitoring of Pole Transformers

Project Reference Number

NGED_NIA_091

Project Licensee(s)

National Grid Electricity Distribution

Project Start

August 2026

Project Duration

0 years and 6 months

Nominated Project Contact(s)

Favour Eboh

Project Budget

£234,235.00

Summary

This project aims to develop and test a scalable approach for assessing the external condition of pole‐mounted transformers using high‐resolution aerial imagery and automated visual analysis. By combining routine helicopter and drone image capture with computer‐vision techniques, the project will identify and classify visible condition indicators such as corrosion, oil leakage, structural condition, and bushing health, and convert these into standardised, auditable asset condition data aligned with CNAIM. The project will also compare the cost, efficiency, and suitability of helicopter versus drone‐based capture for this use case. The outcome will be evidence on how pole‐mounted transformer condition can be monitored more consistently and efficiently, supporting earlier intervention, improved network resilience, and readiness for ED3 regulatory reporting.

Third Party Collaborators

Softwire

Team UAV

Problem Being Solved

Pole-mounted transformers are inspected through existing foot patrol and aerial activities, but the outputs are not structured in a way that provides a reliable, asset-level view of condition at scale. The current process is largely manual, time-consuming, and dependent on subjective judgement. Assessments can vary between inspectors, records can be incomplete, and condition information has not always been linked directly to the transformer asset itself. As a result, it is difficult to track deterioration trends, compare assets consistently, identify which transformers are at greatest risk, and make confident decisions on prioritisation, replacement, and longer-term investment.

Aerial inspection using helicopters can provide broader coverage but does not always capture the parts of the transformer that matter most, such as the underside, early-stage oil leakage, or defects that are obscured by viewing angle, mounting position, or surrounding infrastructure. Ground-based inspection faces similar limitations from the topside, where achieving consistent condition grading across a large and geographically spread fleet is difficult in practice. Together, these constraints mean that important deterioration can

go unidentified, under-recorded, or inconsistently classified.

The problem is more pronounced in coastal areas, where corrosion can progress more quickly and assets may deteriorate earlier than expected. In these locations, limited condition visibility increases the risk of missing developing deterioration before it leads to failure, oil leakage, environmental contamination, or safety concerns.

This is now a growing regulatory concern as well. PMTs are becoming more important within CNAIM and NARM-related processes, and condition data needs to be consistent, traceable, and auditable to support those requirements. Where it is not, there is a real risk of applying the wrong condition assumptions to assets, allocating incorrect risk points, and producing Health Index outputs that cannot be properly defended. That creates compliance exposure and weakens the quality of risk-based decision-making at a time when regulatory expectations around structured PMT condition evidence are increasing ahead of ED3.

Method(s)

The PMT Scan project will develop and test an AI-enabled aerial inspection and condition assessment process for pole-mounted transformers, covering the full pathway from image capture through to structured condition outputs that can support asset health and risk processes.

The first stage will establish the image capture standard needed for reliable assessment and collect a representative dataset of PMT images across coastal, inland, and rural environments. This will cover image resolution, viewing angles, coverage, lighting, and occlusion tolerances, with quality assurance checks applied to confirm that images are suitable for analysis and correctly linked to asset records. The project will use both helicopter and drone-based capture methods and compare their relative image quality, practicality, time efficiency, and cost to inform the most suitable approach for future use.

The second stage will develop the condition assessment approach using computer vision models trained on the labelled image dataset. The models will be trained to identify the transformer, separate it from the background, and detect visible condition indicators including corrosion severity, oil leakage or staining, tank body defects, bushing defects where visible, and structural deterioration of mounting components. Outputs will be produced as condition classes and confidence scores, with the process also testing whether parts of the assessment can be automated or semi-automated to reduce manual effort at scale.

The third stage will validate the method against manual inspections and engineering judgement on a selected cohort of assets across different environments, including coastal locations where corrosion risk is higher. This will be used to test performance, refine classification thresholds, and improve accuracy, particularly for higher-risk defects such as severe corrosion and oil leakage.

The fourth stage will translate the condition outputs into CNAIM-aligned condition categories and test how they can be integrated into NGED's Health Index and risk processes. This will include developing mapping logic, maintaining full traceability from the original image through to the mapped condition output, and demonstrating an auditable pathway from captured image to structured condition data. The project will also test how outputs could flow into existing data architecture, including NGED's internal asset data and NARMs reporting systems, to confirm alignment with current reporting pathways.

The final stage will assess how the method could be scaled across the wider PMT fleet. This will cover rollout planning, operational requirements, cost-benefit considerations, and the findings from the capture method comparison, to define the most practical and cost-effective approach for future deployment.

Measurement Quality Statement

Measurement quality will be controlled through defined image capture standards, quality assurance checks, and structured validation of model outputs. The project will confirm whether images meet the required quality threshold for analysis and will measure model performance using recognised metrics such as precision, recall, and F1 score, supported by comparison with engineering judgement and inspection evidence.

Data Quality Statement

Data quality will be managed through asset-linked image records, structured labelling, and validation checks during dataset creation, model training, and output generation. The project will apply clear metadata standards, consistent labelling rules, and traceable condition outputs so that results can be linked to the correct transformer asset and used reliably in later analysis and reporting.

Scope

The PMT Scan project will develop and test a practical method for assessing the external condition of pole-mounted transformers

using aerial imagery and structured condition analysis. The scope covers visible external deterioration that affects asset health and risk, including corrosion, oil leakage or staining, and damage to components such as tanks, radiators, brackets, and mounting arrangements.

The project will include defining image capture requirements, creating and labelling a representative image dataset, developing and validating a condition assessment process, and converting outputs into structured condition information that can support asset health and risk processes. It will also assess how condition information can be linked more effectively to the transformer asset itself and used within existing asset management systems and reporting frameworks. The project will test whether parts of the assessment process can be automated or semi-automated, which could reduce manual effort and make large-scale condition assessment more practical going forward.

The work will be carried out through a pilot across a representative sample of transformers in different operating environments, including higher-exposure locations where deterioration may progress more quickly. The scope also includes comparing helicopter and drone-based capture methods to understand their relative image quality, practicality, time efficiency, and cost.

This phase is intended to prove whether the method is workable, accurate enough, and practical for wider use. It is not intended to deliver full fleet rollout, replace existing inspection activity, or carry out network-wide replacement works.

Net Benefits for Consumers

Pole-mounted transformers are widely used in rural and village networks, and failures in these areas can be more disruptive and harder to recover from quickly, particularly for customers who are more vulnerable to the effects of a loss of supply. The project will help NGED identify deteriorating transformers earlier and act before issues develop into more serious failures, reducing the risk of unplanned interruptions in these communities.

There are also safety and environmental benefits. Earlier identification of deteriorated assets will help reduce the risk of failures that could lead to falling equipment or oil-related environmental incidents. This is especially relevant in coastal and higher-exposure areas where environmental conditions may accelerate deterioration and increase the likelihood of asset failure.

Consumers also benefit when investment decisions are based on better evidence. More consistent condition data will help direct resources toward the transformers that present the greatest risk, improving the efficiency of maintenance and replacement planning and helping to avoid poorly targeted interventions.

Direct Financial Benefits to NGED

The most direct financial benefit is a reduction in the manual effort currently needed to assess PMT condition at scale. A more structured image-based approach will lower the time and cost involved in turning inspection activity into usable condition data, and if parts of the process can be automated or semi-automated, that saving could be more significant across a large fleet.

Better condition visibility will also support earlier and more targeted intervention, reducing exposure to the higher costs that come with reactive maintenance, emergency replacement, and unplanned response. Identifying deterioration earlier, particularly in coastal areas where corrosion progresses quickly, will help convert reactive failures into planned works, which are considerably cheaper and less disruptive to manage.

Improved condition data will also strengthen the quality of asset health and risk inputs used for investment planning. More accurate and consistent condition scoring will support better prioritisation, reduce the risk of misinformed investment decisions, and improve the defensibility of Health Index and NARM outputs ahead of ED3. That has financial value in its own right, as poorly evidenced condition data can lead to misallocated spend and increased regulatory scrutiny.

Finally, testing the method at pilot scale before any wider commitment reduces the financial risk of investing in an approach that may not perform as expected. The project is designed to generate the evidence needed to make that decision with confidence.

Objective(s)

The PMT Scan project aims to prove whether aerial imagery and structured condition analysis can provide a more reliable, consistent, and scalable way of managing pole-mounted transformer condition. To do that, the project will:

- Develop a practical method for assessing the external condition of pole-mounted transformers from aerial imagery, covering visible deterioration such as corrosion, oil leakage, tank body defects, bushing defects where visible, and structural deterioration of mounting components.
- Define the image capture requirements needed for reliable condition assessment, including resolution, viewing angles, coverage, and quality standards suitable for use across coastal, inland, and rural environments.

- Create a labelled PMT image dataset and condition grading approach that can support repeatable and consistent defect classification across a representative range of asset conditions.
- Test whether parts of the condition assessment process can be automated or semi-automated, reducing manual effort and making large-scale assessment more practical and consistent.
- Validate the method against manual inspections and engineering judgement, including assets in coastal environments where corrosion risk is higher, to confirm whether outputs are accurate and reliable enough for operational use.
- Develop the logic needed to translate condition outputs into CNAIM-aligned condition categories and test how those outputs can be integrated into NGED's Health Index and NARM-related processes ahead of ED3.
- Compare helicopter and drone-based capture methods to understand their relative image quality, practicality, time efficiency, and cost for future deployment.
- Define what would be needed to scale the approach across the wider PMT fleet, including operational, data, and integration requirements.
- Generate practical learning that supports future rollout within NGED and provides transferable insight for other network licensees facing similar challenges.

Consumer Vulnerability Impact Assessment

The PMT Scan project is not expected to have direct adverse effects on consumers in vulnerable situations during delivery. It does not involve changes to customer supply, planned interruptions, customer installations, or direct customer participation. The benefit to vulnerable consumers is indirect, through improving how NGED identifies and manages deteriorating pole-mounted transformers before they fail.

Pole-mounted transformers are widely used in rural and village networks, where outages can be harder to restore quickly and where some customers are more exposed to the effects of a loss of supply. This includes people who are medically dependent on electricity, older residents, those with limited mobility, people with caring responsibilities, and households less able to respond to or recover from an interruption.

By improving visibility of transformer condition and supporting earlier identification of higher-risk assets, the project will help NGED target maintenance and replacement activity more effectively, reducing the likelihood of unplanned outages in rural and harder-to-reach communities where restoration times tend to be longer and the impact of losing supply is greater. Better condition data will also support earlier intervention, reduce unnecessary manual effort, and improve the efficiency of network expenditure, all of which contribute to a more reliable service for customers who depend on it most.

For households already managing on tighter budgets, avoiding unplanned outages also matters financially. Interruptions can bring unexpected costs around alternative heating, food replacement, travel, or other support needs that not everyone can easily absorb. A more proactive approach to identifying and addressing deterioration before it leads to failure will help reduce the frequency of those situations.

The impact on personal wellbeing can be the most significant for some customers. For people who depend on electricity for medical equipment, heating, or daily care needs, an unplanned outage is not just an inconvenience. Reducing the risk of transformer failures, oil-related incidents, and safety concerns will help protect the health, comfort, independence, and peace of mind of those least able to manage when things go wrong.

Overall, the project is expected to have a positive distributional impact. Its value for vulnerable consumers lies in building a more proactive and reliable approach to managing an asset class that serves some of the most exposed communities on the network.

Success Criteria

NGED will consider PMT Scan successful if it demonstrates that a structured image-based approach can produce PMT condition information that is accurate, consistent, and practical enough to support future asset management use.

Success will be evaluated against the following:

- **A representative pilot dataset is created** : A set of PMT images is captured across coastal, inland, and rural environments with sufficient quality, coverage, and asset linkage to support model training, testing, and validation. The coastal cohort should include locations where corrosion risk is known to be higher, such as Cornwall.
- **Image quality standards are met** : Captured images meet the agreed requirements for resolution, viewing angle, and coverage, with a high proportion passing quality assurance checks and confirmed as suitable for condition assessment.
- **The condition assessment method produces credible results** : The method identifies and classifies visible condition indicators, including corrosion, oil leakage, tank body defects, bushing defects where visible, and structural deterioration of mounting components, with performance levels that are considered reliable for asset management use. Performance will be measured using precision, recall, and F1 score, together with review of false positives and false negatives.

- **Outputs are validated against engineering judgement and inspection evidence**: Results are shown to be broadly consistent with subject matter expert review and ground-truth inspection evidence across both coastal and inland environments, demonstrating that the approach is repeatable and suitable for practical use.
- **The potential for automation or semi-automation is assessed**: The project provides a clear view of which parts of the condition assessment process could realistically be automated or semi-automated, and what that would mean for manual effort, consistency, and scalability.
- **Condition outputs can be linked to the transformer asset and used in risk processes**: The project shows that outputs can be correctly linked to PMT asset records and translated into a format that supports CNAIM, Health Index, and NARM-related processes ahead of ED3.
- **The approach produces more consistent condition information than current methods**: The project demonstrates that the method can provide more consistent, asset-specific, and auditable condition information than the current largely manual approach.
- **The capture method comparison produces usable findings**: The comparison of helicopter and drone-based imagery provides enough evidence to understand their relative image quality, practicality, time efficiency, and cost, and to inform which approach or combination of approaches is most suitable for future use.
- **A credible deployment roadmap is produced**: The project delivers a clear roadmap setting out the technical, operational, data, and commercial requirements for scaling the method across the wider PMT fleet.

Project Partners and External Funding

PMT Scan will be delivered through a combination of NGED internal teams and specialist external partners.

Within NGED, the project will be led by the Innovation team, with support from the Asset Management team, the Helicopter Unit, IT&D, and Engineering Policy. The Innovation team will provide project governance and oversight, while Asset Management will contribute subject matter expertise on PMT condition, CNAIM, and Health Index processes. The Helicopter Unit will support aerial image capture, and IT&D and Engineering Policy will provide technical and standards input where needed.

The main external project partner is Softwire, a specialist software development and technology consultancy with experience delivering secure, scalable data platforms, AI-ready systems and digital products for regulated environments. Relevant examples include Softwire's work with Elexon, where they developed a real-time, high-availability data platform for the GB electricity market, and Moorfields, where they built an AI-ready cloud platform to manage millions of medical images securely. In PMT Scan, Softwire will support the

technical delivery, including system architecture, image data pipeline design, software development, integration of condition outputs into structured business data, and support with the deployment roadmap

The project will also work with Team UAV, a specialist drone inspection and data capture provider with experience supporting infrastructure operators through precision aerial surveying and inspection. Their role will be to provide drone-based imagery as part of the capture comparison activity, helping assess the practicality, image quality, time efficiency, and relative cost of drone capture compared with helicopter-based inspection for PMT condition assessment.

Potential for New Learning

PMT Scan will generate practical learning on how pole-mounted transformer condition can be assessed more consistently using aerial imagery and structured condition analysis. That includes what image quality and coverage is needed to assess visible deterioration reliably, how well corrosion, oil leakage, bushing defects, and external component damage can be identified from captured imagery, and how outputs can be validated against engineering judgement and inspection evidence across different environments, including coastal locations where corrosion risk is higher.

The project will also produce learning on how condition information can be properly linked to the transformer asset and translated into a form that is useful for asset health, risk, and regulatory processes. This covers data quality, asset linkage, condition classification, and how image-based condition evidence could support CNAIM, Health Index, and NARM-related inputs ahead of ED3. Alongside this, the project will test whether parts of the assessment process can be automated or semi-automated, and what that could mean for scalability, manual effort, and the practicality of keeping condition data current across a large fleet.

The comparison of helicopter and drone capture methods will also generate useful learning on their relative image quality, efficiency, practicality, and cost, helping inform the most suitable approach for future deployment.

Learning will be shared through a final project report, deployment roadmap, and supporting technical documentation covering the method, findings, and limitations. It will also be disseminated through internal stakeholder sessions, lessons learned workshops, and industry knowledge-sharing routes including the ENA Smarter Networks Portal. This will help ensure the findings are accessible to other network licensees considering similar approaches to PMT condition assessment.

Scale of Project

PMT Scan is a pilot project designed to test whether aerial image capture, condition assessment, validation, and integration into risk processes can work in practice before any wider deployment is considered. The investment is therefore focused on generating enough evidence to make that judgement with confidence, rather than committing to full fleet rollout too early.

The pilot will cover a representative sample of **500 to 1,000** pole-mounted transformers across coastal, inland, and rural areas, capturing the environmental variability needed to test the method properly. The sample will include a balanced mix of corroded and healthy assets to support both model training and validation. Coastal locations, where corrosion risk is known to be higher, will form an important part of that sample to ensure the method is tested under more demanding conditions.

A smaller project would limit the value of the learning. A narrower range of images, defect types, and environments would make it harder to judge whether the method performs reliably enough for wider use, weaken the comparison between helicopter and drone capture, and reduce confidence in whether the outputs could support asset management and ED3-related processes at scale. It would also make it more difficult to draw any meaningful conclusions about the potential for automation or semi-automation across a large fleet.

If the pilot is successful, the method could be scaled across NGED's wider fleet of around **120,000 PMT**s, enabling more consistent and potentially automated condition assessment and better integration into existing risk models. That gives the project a clear path from a controlled pilot to much wider network benefit.

Technology Readiness at Start

TRL4 Bench Scale Research

Technology Readiness at End

TRL6 Large Scale

Geographical Area

The PMT Scan project will take place across NGED's electricity distribution licence areas, with the pilot covering pole-mounted transformers across the South West, South Wales, East Midlands, and West Midlands. This spread ensures the method is tested across a realistic range of operating conditions, asset types, and environmental exposure levels.

The South West, including Cornwall, is a priority location within the pilot. Corrosion concerns on pole-mounted transformers in this region are already well documented, with proximity to the sea associated with accelerated deterioration on tank surfaces, welds, and mounting hardware. Including this cohort will help ensure the method is tested under more demanding conditions and that the outputs are robust enough to support decision-making in higher-risk locations.

The inclusion of inland and rural sites across the other licence areas will ensure the learning is not limited to coastal conditions and that the method can be shown to work across the wider network before any deployment decision is made.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

Total Project Cost
£ 234,234.63
NGED DNO Contribution
£23,423.46
Funding from NIA
£210,811.17

Project Eligibility Assessment Part 1

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

As the network adapts to higher demand, greater electrification, and the growth of low-carbon technologies, asset decisions will need to be based on better quality condition data. PMT Scan will improve how NGED understands and manages the condition of pole-mounted transformers by testing a more structured and scalable way of assessing external deterioration using aerial imagery and condition analysis.

If the method proves effective, it will support a more proactive and data-led approach to managing corrosion, oil leakage, and external damage before failure occurs. That will help identify higher-risk assets earlier, support more targeted maintenance and replacement, strengthen asset health and risk information for planning and investment, and test how digital or semi-automated condition assessment could be used in practice across the network.

How the Project has potential to benefit consumer in vulnerable situations:

PMT Scan will help reduce the risk of failures on pole-mounted transformers before they lead to outages, safety concerns, or environmental incidents. This is particularly relevant in rural and coastal communities, where PMTs are widely used, where interruptions can be harder to restore quickly, and where the consequences of losing supply can be greater for customers who are medically dependent on electricity, older, less mobile, or less able to respond to disruption.

By improving condition visibility and supporting earlier and more targeted intervention, the project will help improve reliability and reduce the likelihood of unplanned interruptions for the customers who are least able to manage when they occur.

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved

n/a

Please provide a calculation and/or description of the expected benefits of the solution

Manual review of 120,000 PMTs at an estimated £15 per asset gives a baseline cost of £1.8 million. Against a method cost of £234,234.63, the expected net benefit is approximately £1,565,765.37. The primary recipients of that benefit are electricity distribution consumers through more efficient use of network expenditure and better-targeted maintenance and replacement decisions.

Beyond that direct saving, better condition visibility will support earlier intervention, reduce exposure to reactive maintenance and emergency response costs, and help avoid the environmental and financial consequences of deterioration being identified too late. If the project also demonstrates that parts of the image capture process could in future be carried out using smaller drones operated by trained field staff, the operational cost of keeping condition data current across a large fleet could reduce further over time. Stronger condition inputs will also improve the quality of CNAIM and NARM-related risk outputs, reducing the risk of misallocated investment and supporting more defensible regulatory reporting ahead of ED3

Please provide an estimate of how replicable the Method is across GB

Pole-mounted transformers are a common asset type across GB electricity distribution networks, particularly in rural and semi-urban areas. The method is not limited to one geography or inspection route and is expected to be relevant to 100% of PMTs across GB, representing several hundred thousand assets. It is particularly applicable to networks with overhead assets in exposed environments where corrosion risk is higher and where consistent condition assessment at scale has been difficult to achieve through existing

inspection methods.

Please provide an outline of the costs of rolling out the Method across GB.

Rollout costs would vary by licensee depending on fleet size, existing image capture arrangements, internal data systems, and operating model. For NGED, the next-stage rollout cost is expected to be in the region of £200,000 to £500,000, covering model adaptation, system integration, and operational deployment.

A wider GB rollout would most likely be phased by licensee rather than delivered as a single national programme, with costs covering image capture, dataset preparation, model tuning, system integration, staff training, and ongoing operational support. Where smaller drones operated by field staff prove to be a practical capture option, that could help reduce the ongoing cost of data collection and make the method more accessible for licensees with different inspection arrangements.

Requirement 3 / 1

Involve Research, Development or Demonstration

Projects must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☐ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☐ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

Involve Research, Development or Demonstration - Please select all that apply

☑ A specific piece of new equipment (including monitoring, control and communications systems and software)

☑ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☑ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☑ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

PMT Scan will generate practical learning on how pole-mounted transformer condition can be assessed more consistently using aerial imagery and structured condition analysis. That includes what image quality, coverage, and viewing standards are needed for reliable assessment, how visible defects such as corrosion, oil leakage, tank body damage, bushing defects, and structural deterioration can be identified and classified, and how outputs can be validated against engineering judgement and inspection evidence across different environments, including coastal locations where deterioration risk is higher.

The project will also produce learning on how condition outputs can be linked to the transformer asset and translated into structured information that supports CNAIM, Health Index, and NARM-related processes. The CNAIM mapping logic and condition classification framework developed through the project will be directly transferable, giving other licensees a practical basis for improving the quality and consistency of their own PMT condition inputs ahead of ED3.

Other electricity distribution licensees managing pole-mounted transformers in rural and semi-urban networks will be able to draw on this learning to reduce reliance on manual review, improve condition data quality, and support more targeted and evidence-based asset management decisions.

The project will also generate learning on capture methods, including the relative strengths of helicopter and drone imagery, and whether parts of the assessment process could be automated or semi-automated. That broader learning on inspection, data capture,

validation, and condition scoring could be applied to similar asset management challenges beyond PMTs, making the outputs relevant to a wider range of network licensees and asset types.

n/a

Is the default IPR position being applied?

☑ Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed. Networks must explicitly mention similar projects that they have considered and how these differ.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

No unnecessary duplication will occur as a result of this project. PMT Scan addresses a specific gap in distribution asset management, namely the lack of a scalable, cost-effective, and auditable way to assess the external condition of pole-mounted transformers and use that information within asset health and risk processes.

The project is not repeating an existing solution. It is developing and demonstrating a PMT-specific method that combines aerial image capture, condition assessment, validation against inspection evidence, and translation of outputs into CNAIM-aligned condition information. PMTs have their own condition features, data requirements, and operational context that are not addressed through existing inspection processes or previous innovation work on other asset types.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

Some earlier projects have used AI or computer vision for asset condition assessment, most notably VICAP, which applied image-based corrosion detection to transmission steel towers and demonstrated how automated assessment can support asset management decisions at scale.

PMT Scan is materially different. It is focused on pole-mounted transformers in the distribution network, which present a different set of condition challenges, including corrosion, oil leakage, tank body defects, bushing defects, and mounting deterioration, rather than structural corrosion on steel towers alone. The operating environment is also different, with PMTs spread across rural, inland, and coastal locations where environmental exposure varies significantly and where condition visibility has been particularly difficult to achieve.

The project goes further than defect detection. It will test the full pathway from image capture standards through to validation, CNAIM mapping, and integration into Health Index and risk processes. It will also compare helicopter and drone capture methods and assess whether parts of the process could be automated or semi-automated. None of that has been done for this asset class in this regulatory and operational context, which is precisely where the new learning sits.

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

PMT Scan is innovative because it applies aerial imaging and AI-based condition assessment to pole-mounted transformers in a way that is not currently part of normal practice. The project is not simply looking at whether defects can be spotted from images. It is developing a full process for capturing suitable images, identifying visible deterioration including corrosion, oil leakage, tank body defects, bushing defects, and mounting deterioration, checking outputs against engineering evidence, and turning results into structured condition data that can be used in asset health and risk processes.

What makes it different is the combination of technologies and how they are being applied to this asset class. Pole-mounted transformers have not previously had a defined image capture standard, PMT-specific defect classes, or an auditable route from aerial image to condition score. The project is also testing whether parts of the assessment can be automated or semi-automated, and whether helicopter and drone capture can both play a practical role in future deployment.

Relevant Foreground IPR

PMT Scan is expected to generate a clear set of Relevant Foreground IPR that will form the core of the method and support its use beyond the pilot. This includes the raw and annotated PMT image datasets, the PMT-specific computer vision models, the condition assessment pipeline and logic, the classification thresholds and tuning rules, the CNAIM mapping framework, the data schema and metadata standards, the image capture and quality assurance standard, and the benefits case and deployment roadmap.

Together, these outputs will define how PMT images are captured, prepared and assessed, how visible condition issues such as corrosion, oil staining and structural defects are identified and classified, and how the resulting condition grades can feed into asset health and risk processes. The models developed through the project will form part of the PMT-specific learning, as they will be trained and validated using project data and configured to produce outputs suitable for condition scoring and CNAIM alignment.

Softwire will support the development of these outputs through its software engineering, data pipeline, system architecture and integration expertise. The PMT-specific outputs created through the project, including the models, classification approach, image standards, CNAIM mapping logic, validation outcomes and deployment model, will form the key Foreground IPR and support future deployment within NGED and potential application by other network licensees.

Data Access Details

Project data will be shared with interested parties in line with RIIO-2 NIA requirements and NGED's normal innovation data-sharing approach. Requests for project data can be made through NGED's innovation contact route. Where possible, shareable outputs will include de-sensitised datasets, summary findings, technical documents, and other materials that support learning and replication.

Please identify why the Network Licensees will not fund the project as a part of it's business and usual activities

This is not business as usual because the method is still unproven. The project needs to show that suitable images can be captured consistently, that assessment outputs are accurate enough to be trusted, and that the overall process works in a real operating environment. There is also uncertainty around how well the method performs across different conditions, how easily outputs can be linked to PMT assets, and whether the benefits justify wider rollout. Until those points are tested, it would not be appropriate to fund this as standard operational activity.

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks (e.g. commercial, technical, operational or regulatory) associated with the project

NIA support is needed because the project sits between a clearly identified business need and an unproven method, carrying a level of technical, operational, and commercial uncertainty that makes it difficult to justify through normal operational funding alone.

On the technical side, it is not yet known whether aerial imagery will consistently capture the right parts of the transformer, whether AI models will perform reliably across coastal, inland, and rural environments, or whether the outputs will be accurate enough for practical asset management use. Operationally, there are still open questions around how the method fits into existing inspection and data processes, whether helicopter and drone capture are both workable at scale, and whether automation or semi-automation is genuinely achievable. Commercially, the cost of wider rollout, the effort of system integration, and the overall value of the approach all need to be tested before any broader commitment can be made.

The project also needs to respond to a growing regulatory need for more robust PMT condition evidence ahead of ED3, but that value can only be realised once the method has been proven. NIA provides the right mechanism to do that in a controlled and accountable way, generating the learning and evidence needed before any wider deployment decision is made.

This project has been approved by a senior member of staff

☑ Yes