SIF Beta Project Registration

Date of Submission

Aug 2023

Project Reference Number

10068173

Project Registration

Project Title

Predictive Safety Interventions - Beta

Project Reference Number

10068173

Project Licensee(s)

SGN

Project Start

Aug 2023

Project Duration

18 Months

Nominated Project Contact(s)

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Project Budget

£1,189,696.00

Funding Mechanism

SIF Beta - Round 1

SIF Funding

£1,109,696.00

Strategy Theme

Data and digitalisation

Challenge Area

Data and digitisation

Lead Sector

Gas Distribution

Other Related Sectors

Lead Funding Licensee

SGN - Southern England (inc South London)

Funding Licensees

SGN - Scotland

Collaborating Networks

Cadent

Technology Areas

Health and Safety

Summary

The PSI Beta project is fully aligned with the SIF Beta Challenge for Data and Digitalisation, and successful project completion will deliver the next generation of user driven digital products, services, and processes. The project will create a predictive safety model in

the gas sector and ready to take to the wider energy sector and utility sector globally, aligned with the Beta challenge phase.
According to HSE annually released statistics, at least 10,000 working days were lost to injury in the wider utility sector in the 21/22 financial year, with the estimated cost of fatal and non-fatal injuries more than £160m. The PSI has a clear and direct target to prevent the occurrences of fatal and non-fatal injuries, which will reduce the cost of operating energy networks, a direct objective and aim of the SIF challenge for Data and Digitalisation.
FYLD has become the tool of choice to manage safety and productivity in the workforce at SGN and has delivered a 20% reduction in incidents and injuries alongside annual financial savings of c.£4.5m. We forecast the safety improvement opportunity from successful PSI completion to be well beyond these outcomes, using predictive analytics to identify which workers and activities will have a safety incident and push teams to intervene and respond before they occur. FYLD's vision is to assist every fieldworker to take corrective actions and put unsafe conditions right in real time.

n the Alpha phase, FYLD and SGN proved it was possible to accurately quantify risk scores in real time and prompt a preventative or mitigating action, deploying the machine-learning model in a proof of concept. The model drew on 3 different live-data inputs, delivering an accuracy of 57%. We demonstrated that the model accuracy was improved through an increased number of data sources, noting that applying the live weather to the model increased accuracy alone by 4%.
Our problem understanding also grew in the Alpha phase with respect to the method of surfacing interventions. In our Alpha submission we targeted building and deploying a control suggestion, however during our governance sessions, we remained agile and built the capability to push high risk notifications - enabling an AI powered human intervention. The outcome was positive - we saw a 35%increase in the response rate from field teams in high-risk vs non-high-risk jobs. We hypothesise that we can increase this improved response through iterations, human validation of recommendations, and improved AI powered interventions, which will be delivered in the Beta phase.
We can say with confidence that we are beginning to accurately predict the presence of a safety risk on site and intervene in real time. We will take this further in the Beta project, iterating the model through greater data sources. We will build the ability to capture and integrate live situational data from local traffic and roadworks, alongside human related factors such as fatigue, voice tone or behaviour changes. We will develop the object recognition to go beyond detecting objects on controls, and research the ability to detect where site set ups are non-compliant and contribute to safety risk.

User Needs & Personas

- Fieldworkers face a reduced capacity to perceive risk on site due to overexposure, and differing capabilities mean individual risk tolerance varies by individual. The project will seek to address the lack of access to data of historic incidents or safety events, or the inability to draw a link between those safety events and risk factors that may be present
- Field team managers - expectations exist to interact in many risk assessments, but time demands mean that this cannot always be immediate. By enabling managers to focus their attention and prioritise sites identified as high risk from live data inputs, we can target a second set of eyes where it is needed most and shift away from ineffective sampling techniques
- Senior and safety managers - further removed from site activities, senior and safety managers need to have confidence in, and the ability to visualise, risk management. Creating risk quantification and visibility via interactive dashboards, and the ability to performance manage the associated mitigation, or be alerted when risk hits unacceptable levels, are key drivers for this persona group

FYLD are best placed to assist SGN and bring this solution to market through:

1. A high-performing team with experience launching and maintaining AI/ML products in the remote field service industry
2. A demonstrable history of realising significant cost savings for utilities companies by deploying innovative solutions
3. Existing technology and datasets that can be built upon
4. In-house experience and expertise in change-management required for digital transformation, specifically within safety and productivity of utility companies, at scale

Project Description

According to HSE annually released statistics, at least 10,000 working days were lost to injury in the wider utility sector in the 21/22 financial year, with the estimated cost of fatal and non-fatal injuries more than £160m. The Predictive Safety Interventions project (PSI) has a clear and direct target to prevent the occurrences of fatal and non-fatal injuries, which will reduce the cost of operating energy networks, a direct objective and aim of the SIF challenge for Data and Digitalisation.
Through the Discovery and Alpha phases, FYLD and SGN partnered to produce an artificial intelligence model to enable Predictive Safety Interventions. The predictive model is trained on safety indicator event data, and previous near-miss and injury occurrences, to accurately forecast the likelihood of an injury occurring to a fieldworker.
The Beta project phase will develop this model further, increasing data inputs into the model to include human behaviour factors. We will integrate fatigue levels into the predictions, and test and research the ability to detect changes in voice tone or pitch as an indicator of how human behaviours impact safety events. We will also integrate live network data, such as traffic and roadworks, alongside further development of the object-recognition model, including pioneering research to detect non-compliant control measures.
The project will build the capability to deliver an AI powered personalised intervention pushed directly into the hands of field teams and

their remote managers at the point of starting work, and dynamically doing so as the workday progresses. This will enable the near-automation of sharing of learning from previous safety indicator events, including near misses and injuries, directly to the front-line on high-risk activities. The project will then progress to deploying the prediction model to all of SGN field operations to successfully reduce safety incidents.
Successful delivery of this project will see a market-leading AI model to predict on site incidents before they happen and power an intervention to prevent them occurring. This will deliver a reduction in fatal and non-fatal injuries in the sector and will reduce the cost of operating energy networks from eliminating the associated cost of injuring and killing our workforce.

Add Preceding Projects

10037420 - Predictive Safety Interventions - Alpha

Nominated Contact Email Address(es)

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Project Description And Benefits

Applicants Location

Location information
Southern Gas Networks
St Lawrence House, Station Approach, Horley, England, RH6 9HJ
FYLD
5 New Street Square, London, United Kingdom, EC4A 3TW
Cadent
Ansty Park, Pilot Way, Coventry CV7 9JU
NGN
1100 Century Way, Thorpe Park Business Park, Colton, Leeds LS15 8TU
WWU
Wales & West House, Spooner Close, Celtic Springs, Coedkernew, Newport, NP10 8FZ
National Grid Gas
Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA
Demonstration of Project Location
Location of the trail will be rolled out in a regional area of SGN Southern to mirror Alpha with the long-term plan of roll out across SGNs network. Due to the nature of the product, the actual live location can be multiple sites where it meets the requirement to complete a risk assessment.

Project Short Description

Through the Discovery and Alpha phases, FYLD and SGN partnered to produce a prediction model trained on live safety indicator data, and previous near-miss and injury occurrences, to accurately forecast the likelihood of an injury occurring.
The Beta project phase will develop this model further, increasing data inputs into the model to include human behaviour factors such as fatigue and field worker behavioural changes, alongside live situational data including local traffic and roadworks, with further development of the object recognition model.
The result will be an AI powered intervention pushed directly into the hands of field teams at the point of starting work and dynamically doing so throughout the day, sharing learning from previous safety indicator events directly to the front-line on high-risk activities. The project will then deploy the prediction model to all SGN field operations to successfully reduce incidents.
Successful delivery of this project will see a market-leading AI model predicting on site incidents before they happen and power an intervention to prevent them occurring. This will deliver a reduction in fatal and non-fatal injuries in the sector and will reduce the cost of operating energy networks from eliminating the associated cost of fatal and non-fatal injuries.

Innovation Justification

HSE data shows reduction in safety incidents in the Utilities Sector has plateaued for nearly 10 years, and in fact rose by approximately 6% in 2021-22. The counterfactual solution of 'Do Nothing' has ceased to deliver further reduction in fatal and non-fatal injuries.
Our Alpha project saw the delivery of the prediction model. We hypothesised that by accurately predicting high risk sites before an incident occurred, and prompting an intervention ahead of time, we would build a product with the capability to significantly reduce fatalities and non-fatalities across the industry. We successfully demonstrated we can accurately predict safety events to an estimated accuracy of 57%; and we successfully evidenced we can improve the response rate to high-risk jobs by increasing the intervention rate by 35%.
We will take this further in the Beta project phase by increasing the sources of data to further develop the accuracy of the predictive model and iterate our intervention to deliver tailored and specific learning from previous safety events. This will push a tailored intervention directly into the hands of somebody working in similar conditions that has the potential to result in an injury.
The PSI model is a giant step forward in innovation in the sector. Existing products capture learnings from safety indicator events through basic form data capture but are unable to share the learnings to where they are needed most, by the fieldworkers most vulnerable to incidents and injuries. By automating learning from indicator incidents and applying them across industry when reviewed in conjunction with real-time data inputs, we are taking a leap forward from industry standard of manual reports, manual incident reviews with learnings shared via safety stand-downs and written communication.
Our Beta project will take large steps forward in developing the AI predictive model. We will incorporate human factors such as fatigue levels into the model and undertake industry leading research on the validity of including voice tone and pitch changes as a demonstrator of human behaviours. We will also further the object recognition training, and research the ability to detect non-compliant sites in line with safety standards as an input into the model - a first for the industry to have computer vision analysing sites for non-

compliances.
Rather than relying on fieldworkers to manually report safety events in the hope of preventing them next time, we believe technology is better placed to:

- Capture high-fidelity data
- Recognise patterns in the data
- Analyse growing risk factors across several safety related factors
- Make Interventions in real time automatically triggered when thresholds are met

Commercial readiness levels (CRL) of the PSI model are currently at level 6, in Product/ Solution Optimisation phase. The MVP is built with good early usage data. Our forecast CRL post Beta phase is an 8, with customer validation achieved and the PSI model being introduced to the market.
Integration readiness levels (IRL) is currently at level 6. Integration is achieved with data sources into the model, and FYLD has a bi-directional open API. Our forecast IRL post Beta phase is 7. An additional API type will be developed to integrate asset information directly into the PSI model from SGNs asset management system.
The scale of the Beta project is fully aligned with the SIF Beta Challenge and the target objectives. The Beta project will take the PSI from a proof-of-concept phase with strong early outcomes, to an optimised model deployed in the gas sector and ready to take to the wider energy sector and utility sector globally, aligned with the Beta challenge phase. The clear and direct benefit of reducing fatal and non-fatal injuries will reduce the costs of operating networks, in line with the SIF target benefit.
This project is not suitable to be funded or managed as BAU from either SGN or FYLD. FYLD has spent 18 months in the market growing our customer base across the gas and utilities sectors, and globally across safety critical industries. The product has demonstrated success, and therefore the business focus of FYLD is to further our client base rapidly. Successful Beta funding approval would be used to grow out a capability within the product which can deliver outcomes for the sector but does not have proven marketability to fit in-line with FYLD commercial ambitions. Therefore, the commitment of resources for FYLD is too high risk to undertake as BAU.
For SGN, the PSI project aims to deliver a safety innovation outside of our BAU capabilities. SGN is currently investing under BAU to improve safety culture and practices is seeking incremental improvements to bring SGN in line with best practices. This project is seeking to significantly advance the best practices available in industry. SIF also provides an open platform for sharing knowledge and project outputs, allowing for benefits to be shared to the wider industry.

Impacts and benefits

Successful completion of the Beta phase will deliver financial benefits through a cost reduction in operating energy networks and wider energy systems. This will be delivered by:

1. Reduction of injuries and incidents
2. Lower cost to capture data and share learnings about indicator events

In addition, successful Beta completion will deliver a new to market product and process. Use of predictive safety models to manage and mitigate risk is new to the Utility sector in the UK, with no established predictive models present in the market. This will deliver a core benefit in line with SIF target benefits of:
3. Improved risk visibility across network operations
Within our CBA options in the attached project management tracker, we have run 2 CBA options. Option 1 is full-scale deployment at only SGN within the first 2 years from project commencement, option 2 is deployment to wider industry assuming a 30% uptake from the gas sector only. We have not forecast benefits to the wider Utilities network, including the water industry and other similar industries, as this is not under OFGEMs remit, however it is reasonable to assume that similar benefits would be applied in other industries, for example the water industry.
1. Reduction of lost-time injuries
Based on HSE data, the cost of lost-time injuries in the wider utility sector in 2021-22 amounted to more than £160m (HSE data). The CBA baseline scenario shows the estimated cost to the gas sector over £48m. We hypothesise that through accurately predicting safety events and intervening before a fatality or non-fatal injury occurs, we can substantially reduce the occurrences of fatalities and non-fatal injuries and reduce this cost.
In the Alpha phase, we demonstrated 57% accuracy of the PSI model, and we demonstrated a 35% improvement in response rate from workers to improve safety on site or review the site conditions. In Beta, we are targeting achieving at least a 65% accuracy, which is delivering similar accuracy to other market leading prediction models, for example in the medical sector. If the PSI model could predict 65% of incidents before they occur, with a 75% success rate, the potential annual saving could be in excess of £60m per annum when widely adopted across the industry.
2. Lower cost to capture data about indicator events

In the CBA baseline scenario, we estimate the cost to gas industry, if the delta was addressed between actual and actual near miss

reports, to be approximately
£7.8m. This doesn't include the cost of reviewing and analysing safety incident events, data and trends, and documenting the learning to work forces via safety communication.
Based on the number of lost-time injuries, in the 21-22 financial year, SGN should have reported over 66,950 indicator events including near-misses, based on the Heinrich and Bird safety triangle, widely accepted in the industry. In the Beta phase, we will develop the PSI solution to near-automate the capturing of indicator events as the accuracy of the AI model develops. PSI will deliver substantial time and resource saving from replacing manual processes with an automated model with human validated data collection i.e., the PSI model will be able to detect when a likely safety incident has or will occur and request the worker to validate this. The assumptions in this saving are modest and do not include the extensive time require to analyse data and share learnings.
3. Improved risk visibility across network operations
In line with the target SIF benefit for new to market processes, PSI Beta will deliver the qualitative benefit of improved risk visualisation through performance reporting against predictive safety analytics. Operational and safety leaders across the sector will have the newly developed ability to report on safety trends with live quantification of risk enabling a snapshot view into an AI quantified risk level across real-time sites and workstreams. The reporting and visibility of response to high-risk safety events has the potential to become the first of its kind in enabling cross-company benchmarking of risk through enhanced prediction-based risk visibility.
We have also identified the following key benefits which align to SIF target benefits which have not been quantified for this project:

- Service strike & incident reduction leading to an increased supply security for vulnerable and non-vulnerable customers due to fewer supply interruptions
- Gas leak and major event reduction leading to a proportional reduction in emissions from major gas leaks, hydrogen leaks, explosions, and other major incidents

Cumulative Discounted Net Benefits CBA Option 1 - SGN 100 % Adoption 1 Year - £0.07m
3 Years - £5.16m
5 Years - £9.91m

10 Years £20.46m
CBA Option 2 - SGN 100% adoption + 30% Gas Industry Adoption
1 Year - £0.41m
3 Years - £7.12m
5 Years - £14.59m
10 Years - £35.80m

Project Plans And Milestones

Project Plans, Milestones & Risks

FYLD's PSI will be developed by FYLD and deployed to all SGN field teams with support from operations and safety managers at SGN. Project involvement from Cadent, National Grid Gas and Northern Gas Networks is agreed with innovation resources dedicated to support implementing the model and disseminating the learnings across sector.
There are 4 work packages to this project:
WP1: Predictive Model Improvements - £394,210
Involved Partners -- FYLD, SGN
We will increase the data input sources and test the impact of new inputs into model accuracy and the predicted risk score.
Success Criteria

- Accuracy of prediction model is 65% or greater
- 6+ different data sources are integrated into the model

WP2: Design and UX improvements - £235,970
Lead Partner -- FYLD
We will iterate the current PSI feature line with user feedback and user behaviour, in readiness to a scale pilot and scale deployment within SGN.
Success Criteria

- CSAT score of 7.5 or greater on feature
- Intervention / response rate is increase to 50% or greater
- Model deployed in control environment to 1+ organisation

WP3: Scale Deployment and Collaboration - £243,188
Involved Partners -- FYLD, SGN, National Grid Gas, NGN and Cadent
We will scale the deployment to a large-scale proof of concept before deploying to all SGN field operations and disseminating the learning across the industry through the involved partners.
Success Criteria

- 100% of SGN operational field staff are utilising PSI
- Industry case study verified by AI specialist demonstrating incident reduction
- Delivering leading indicators in deployment of 65% accuracy delivered 50%intervention rate

WP4: AI Powered intervention - £204,890
Involved Partners -- FYLD, SGN, National Grid Gas, NGN and Cadent
We will iterate the intervention/ to deliver a tailored and specific intervention, incorporating human risk factors and job specific recommendations, which will be trained on previous safety event data.
Success Criteria

- 100% of high-risk sites have real-time tailored intervention
- Engagement and response rate to high-risk jobs exceeds 60%

External Risks
Key External risks to project delivery have been identified as:
Regulations and Unions
Trade Union engagement is important, with workforce engagement in the project delivery a critical factor for success. All data inputs proposed for Beta application are not expected to require business processes to be changed, and therefore risk is perceived as low, however engagement will be undertaken throughout the process.
SGN is subject to HSE regulation through the HSWA 1974. The HSE were given a presentation on FYLD during 2021 and its deployment of AI to enable safer workplaces was positively received. It is possible that HSE regulation will be updated over time to include use of AI prediction models, and FYLD will remain close to updates in legislation and agile on the project and future use of PSI in line with regulation.
Technical risk
The use of predictive models in safety is not yet proven in the sector. We are seeing promising results from our Alpha development and remain confident in the ability to make use of the PSI model BAU.

BAU Adoption Risks

The key risks to BAU adoption have been identified as:

Human risk

Whilst it is clear how the adoption of PSI can fit in with business strategy, the willingness of the user base to accept and adopt new technology, alongside trusting the predictions, remains a risk.

SGN's Executive teams are bought into FYLD's vision and will provide strategic and operational assistance to ensure the objectives of the Beta phase are met.

Viability and scalability of product

Despite positive signs from the Alpha developments, there remains a risk about the product capability to scale the predictive model across full organisations for the model to be tested at such a large scale, with the Alpha proof of concept only approximately 15 end users to test this upon. We have mitigated this risk through a planned expansion of the model to increase usage and data capture before full company and wider industry roll out. The project team will also remain agile to ensure we can take the best path from our data-led learning during project delivery.

To effectively manage project risk the project team will implementing a robust stage-gate procedure with the following control points:

- A project governance meeting will be held (weekly) to review the project progress in-line with the success criteria, and the proposed timescales
- Go/ no-go decision process prior to commencement of each project phase and milestone. This decision will be made by the senior sponsor from both FYLD and SGN during a steering committee meeting at each milestone
- Each work package will be separated by a steering group review where the success criteria will be reviewed and agreed before progressing. Any deviance from the originally agreed success criteria will require executive level approval before progressing

Regulatory Barriers

Health and Safety Executive

SGN is obliged under the Health & Safety at Work Act (1974) to provide a safe place for its employees to work. This is a key piece of regulation that will impact this project in a positive way, with employers required by law to undertake safety measures that are reasonably practicable in reducing incidents and injuries. The HSE were given a presentation on FYLD during 2021 and its deployment of AI to enable safer workplaces was positively received.

FYLD and the project outcomes will remain agile and in liaison with the HSE and new regulations to ensure that the PSI remains compliant and at the forefront of regulation. However, it is expected that any new regulation will be in line with the target outcomes for this project, to user predictive technology to reduce injury and harm to workforces.

In due course we will engage with HSE on this new area of development and expect it will also be positively received. We have proactively engaged the HSE's Science and Research Centre and will continue to engage with HSE throughout the project and beyond Beta compilation in the commercialisation phase.

Business As Usual

The project plan has allowed suitable time and resources to ensure that business change management can be undertaken within SGN. The programme will first extend the proof of concept to over 100 users within SGN. This project phase is both intended to significantly increase the data and feedback on the PSI feature, but also to develop and grow trust in the model from the user base to build momentum into the full company-wide deployment with SGN. The learnings from this extended proof of concept phase will enable the required change management process to take place in advance of full-scale deployment.

The project has executive level sponsorship to deliver safety gains within the organisation, which is essential. To support transition the project from proof-of-concept phase to BAU and full adoption, the key SGN internal stakeholders will be Director of Safety and Director of Operations who are very supportive to the project, and act in key leadership roles to oversee the adoption as senior sponsors. Throughout Work Package 3 and the wider deployment, we will identify Regional Leads, supported by the senior sponsors, who can champion the deployment and the expansion of the PSI model within operations to all business units. Safety and Operational sponsors and champions are critical to ensuring project success, to ensure that product engagement is achieved and managed via employee performance management processes during the transition to BAU.

The project will work with the safety team to update relevant internal safety standards and business processes to ensure the use of PSI within BAU is monitored and adopted closely, with engagement levels achieving those of FYLDs core product currently within SGN. Throughout the entire project, the project be monitoring and reporting on project success via feature usage. Initial project targets will focus on leading and proactive indicators, including model accuracy and an increase in the response rate from managers and fieldworkers to reduce on site safety risk. Lagging indicators will include a reduction in safety incidents and injuries to site teams through the subsequent years that follow. As the Alpha project phase developed the ability to record safety incidents in the application, we will be able to directly record and track project outcomes.

Both leading and lagging measures will be accurately recorded and built into a case-study to share the outcomes with the wider industry. The case-study and the findings will be independently verified by leading-AI experts and shared directly to the gas and energy sector, initially via the agreed GDN collaborators before sharing publicly the findings. FYLD has built relationships across the energy

sector alongside the wider Utility Sector, including recent expansions into adjacent sectors including rail and construction. Learnings will be shared both via this established network, and by taking the case study and outcomes to industry events, conferences, and publications to share to the platform.

FYLD and SGN will also engage with Innovate UK and innovation forums to explore sharing project outcomes and ensuring broader industry understands emerging best practice for incident prevention.

The future funding beyond the scope of the project to deliver industry wide adoption will be delivered via FYLD. It is expected that the PSI feature will be applied across safety critical sectors across the globe, with FYLD now having a global presence in the market. Once built and deployed, upon project completion, ongoing maintenance and iterations of the PSI model will be undertaken and funded via FYLD business operating costs. Future pricing of the PSI model outside of the energy sector will be priced accordingly to ensure development and maintenance costs are recovered from revenue streams (see question 12).

Outside of FYLD and SGN, we have agreed collaboration with National Grid Gas, Cadent and Northern Gas Networks, who will be supporting in WP3 and disseminating learnings across the organisations, alongside providing innovation resource to ensure that the project outcomes deliver for the wider market. All parties remain open to consider further deployment and testing in the commercialisation phase, or post Beta completion once the model is proven in the sector. In addition, we have registered interest from parties outside of the energy sector, including water utility Southern Water. As we have highlighted from Discovery through to Beta, our vision remains that the future prediction model will take learnings from all companies and industries. Our Beta project will allow the product changes required to ensure all companies can benefit from the model and the safety benefits it can deliver.

Commercials

Consumer interaction and engagement

One of the clear and direct benefits of this project the reduction in safety events, injuries and near misses. Typical safety events that are common in the energy sector include cable and service strikes, gas leaks and explosions, alongside a wide array of other incidents that can directly impact the end energy consumer. Service strikes and other incidents mentioned cause disruptions to utility supplies, which can be critical for some customers in vulnerable situations who heavily rely on supply security. Accurately predicting and preventing service strikes will reduce the occurrences of these interruptions.

When the project delivers upon its target objective, the PSI model will deliver a reduction in these incidents that lead to an un-planned supply interruption, or other incident types that will have a direct impact on the end customer. It is therefore expected that the project will have a positive impact on energy consumers through increased supply security and fewer interruptions caused by safety events.

Supply shortages and interruptions

The PSI model can help mitigate risks to consumer supplies, such as interference damages, which is especially important for SGN's most vulnerable customers. The model will continuously learn from historical data as well as new, to predict and prevent any unplanned outages to customers as a direct result of an incident, such as a service strike or major safety event. If there were an event to happen, SGN would be able to evaluate, react and reflect in a more time efficient manner than before with engineers engaging onsite and managers being notified at the time of reporting.

Service strikes, RIDDOR gas leaks, and similar incidents that contribute to supply interruptions and emissions of natural and future gases, are within the scope of predictable incidents that this project will seek to deliver. Therefore, this will also support with commitment to reducing emissions of natural gas and any future gases transported, such as hydrogen, resulting in a safer and more secure energy supply for all engineers and customers.

The scope of the PSI project is non-intrusive on the gas network, and therefore the risk of either planned or non-planned supply interruptions as a direct result of the PSI project delivery is low. The project team will remain agile to any increase in risk throughout the delivery of the project. Governance meetings between involved parties, in particular surrounding completion of work packages, will undertake a risk-review. If an unforeseen risk of interruption to supply arises, the team will undertake a risk assessment to ensure that risk is managed and mitigated.

Commercialisation

We have identified throughout our application that the future vision for the PSI model is that it will be applicable to numerous industries globally, and that each company and industry will be contributing to the training of the machine learning model via incident / near miss data capture and job data capture. The first version of the model will be built for and trained on data provided by SGN, but by the end of the Beta phase the model will be ready to be enabled across sectors globally.

FYLD has a global presence in the sectors of Gas & Electricity, Water, Rail, Construction, and other safety critical industries, with clients ranging from utility companies to major construction projects to supply chain.

The immediate focus is the UK Energy Sector, where an estimated 740,000 people work. The training of the predictive model throughout the Alpha and Beta phase will have been based upon SGN data from the gas sector, hence the immediate market post-Beta completion being the market where the model has been trained with proven accuracy.

However, the Beta project scope includes the technical requirements to transition the model, and the prerequisite data collection and integration, to be applicable for all customers using the FYLD platform. FYLD now has over 100 customers across safety critical sectors globally, including a presence in North America, South America, and Australia, outside of the UK. Once successful Beta outputs are hit and a case-study is developed ready for market, this case study will be taken directly to FYLD customers to further train and implement the PSI model in the global markets. This will both extend the benefits to the wider market, and significantly increase the data sets upon which the model is based. The PSI project has a direct route to market through current FYLD customers.

There are no forecast capital requirements to commercialise the innovation beyond minimal working capital, as successful completion of the Beta phase will see a PSI model ready for safety critical markets. The prerequisites before diversifying outside of the UK gas sector after successful Beta completion will be the requirement to train the model on new relevant data specific to the company and industry. Concurrently with the Beta project phase, FYLD will be taking the safety observation and incident reporting feature to market to enable the relevant data capture to diversify the predictive model, ready for the end of the Beta project phase. This will create and available data set that can be integrated post-Beta completion.

Whilst we hypothesise that all industries will contribute to the training of the machine learning model, we remain agile to the data output from the project and will explore alternatives. It may be that the end solution requires a linked but separate machine learning model by industry or geography, to ensure accuracy of the model is relevant to the sector. This will remain closely monitored as we transition to take the solution to market.

Outside of the current FYLD client base, we will look for partnerships to support taking the learnings from the innovation to market. We

will work closely with Innovate UK to look at potential collaboration to support the commercialisation phase and the completion of the Beta. We are also exploring further energy and cross sector partnerships in future, including but not limited to;

- OFWAT
- HSE
- Highways England

The customer value proposition remains clear. In every geography where FYLD operates, our clients have a legal, moral, and financial responsibility to make sure their employees go home safely every day. We aim to deliver a financial ROI from avoiding fatal and non-fatal injuries predicting and preventing injuries before they happen. Reducing incidents and injuries reduces lost time and the subsequent cost to the business, alongside potential fine implications from regulators.
The demonstration of the value proposition is apparent in the CBA. Option 2 shows 100% adoption at FYLD and only 30% adoption with the industry, and within 5 years the project is reaching 15X ROI. With the support of Innovate UK we could push through this adoption rate and into other sectors.

Intellectual Property Rights

The intellectual property and licensing arrangements associated with the project comply with the SIF Governance Document. The IP arrangements will remain open and transparent because:

- Interested parties will be provided with a trial licence to FYLD, immediately enabling them to understand the risk of their own worksites
- The research grade PSI model will be provided for free for OFGEM customers, with FYLD standard FYLD licencing required
- All organisations that opt-in to use FYLD will also consent to sharing their data to the anonymised pool. If required, we'll use methods (such as homomorphic encryption and differential privacy) to ensure that anonymity is maintained, while maintaining the ability to drive meaningful insights between parties.

Costs and Value for Money

The total project costs of the 18-month Beta project are £1,189,696, with a SIF funding request of £1,078,258, and contributions from the partners as £111,438, with an additional £7,532 in a contribution in kind. The cost breakdown across the partners is detailed below.
Project Partner
SOUTHERN GAS NETWORKS PLC
Total costs, £75,312, total contribution in kind £7,532
FYLD LIMITED
Total costs £1,088,160, total contribution £111,438
CADENT GAS LIMITED
Total costs £6,894
NORTHERN GAS NETWORKS LIMITED
Total costs £10,890
NATIONAL GRID GAS PLC
Total costs £8,440
91% of the total project costs are attributed to FYLD for resources for delivering the project, through AI research, critical design, and product development. Labour rates for FYLD have been forecasted using an appropriate day rate from annual salaries and are in line with those from Discovery and Alpha submissions including adjustment for inflation with the current economic climate (3%). These day rates are in line with actual costs experienced by FYLD for committed resources, which are in line with the standards of the industry in which FYLD operates. FYLDs skills and expertise are critical to project delivery, who possess industry leaders across their respective fields, including AI PhD researchers and internationally recognised safety leaders, alongside an experienced executive in taking AI products to market. Forecast costs are also in line with actual costs during the Alpha phase. Learning from the Alpha phase has been applied to the Beta project forecast, noting the slight increase in resource required from FYLD via labour costs that were committed to the project beyond the forecast costs in the Alpha submission. Additional FYLD resource has been allocated to Data Analysts and Deployment Specialists to deliver the project.
The remaining project costs are attributed to SGN (6%), Cadent Gas (1%), Northern Gas Networks (1%) and National Grid (1%).
The total funding requested from SIF is split between the 4 identified work packages;
WP1 - Predictive model improvements
£394,210 is requested for WP1 with the resource allocation for FYLD labour costs to critically design and integrate data sources into the PSI and improve the model accuracy, alongside research and develop further data source model APIs. An allocation of resource is for AI Consultancy Dr Fang Chen to validate data and AI assumptions and findings during the research phase, important as a key independent verifier to findings.
WP2 - Design and UX improvements and & technical changes for market

£235,970 is requested for WP2 with the resource allocation for FYLD labour costs for product developments to critical iterate the feature to suit larger scale deployments and adopt MVP feedback into the product. Also, this allocation allows for technical changes to enable the PSI model to utilise data from other sources within the Utility market, enabling the model to be able to be deployed outside of SGN.

WP3 - SGN scale deployment & market collaboration

£243,188 is requested for WP3. £131,652 is FYLD costs to deploy the solution across SGN including change management and deployment support, and sub-contractor Edume subcontractor cost, who are critical to the project to ensure that company-wide deployments can be delivered in a sustainable way, and has a demonstrated history of success with in-app digital training solutions working with FYLD and SGN. £101,536 is Project Management and Innovation Management costs from SGN, National Grid Gas, Cadent Gas and Northern Gas Networks to collaborate and engage in this project delivery and share the learnings across sector. An allocation is also made to collaborate with SPEN SIF project, if successful, following identification of potential shared learnings, in-particular of current and forthcoming weather pattern data.

WP4 - AI Powered Tailored Intervention

£204,890 is requested for WP4 to develop an AI Powered Tailored Intervention, to critically design and build a tailored to each worker and appropriate management users. This WP resource is allocated to FYLD to design and develop an AI powered tailored intervention which is specific to each high-risk identified activity, based on data trends.

FYLD and SGN are committed to providing additional resources of at least a minimum of the required 10%. FYLD will be contributing directly £111,438 to this project, SGN contributing £7,532, with a combined contribution to the project of 10%. This will be delivered by directly funding the project, including funding the difference between the funding request and the total costs of the project.

Costs for the project have been forecast based on the learnings from the Alpha phase, to ensure value for money is delivered from the project. Project phasing is challenging but achievable to ensure efficient use of resources through the 18-month project. The project delivers significant value for money given the forecast benefits profile in the CBA. The modest option 1, with SGN adoption only, deliver 10X on project costs within 6 years of adoption as BAU, representing significant value for money.

Document upload

Documents Uploaded Where Applicable

Yes

Documents:

SIF Beta Project Registration 2023-08-23 11_37

This project has been approved by a senior member of staff

☑ Yes