Crown Commercial Service

OPERATIONAL TECHNOLOGY AND INDUSTRIAL CONTROL SYSTEMS SECURITY

GCloud Service Description Document

Bringing Ingenuity to Life.
paconsulting.com

Corporate Headquarters
10 Bressenden Place
London
SW1E 5DN
+44 20 7730 9000
paconsulting.com

Prepared by: PA Consulting
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OPERATIONAL TECHNOLOGY AND INDUSTRIAL CONTROL SYSTEMS SECURITY

1.1 Short Service Description

PA works to ensure that Operational Technology security is considered as an enabling function across operational and enterprise environments. This provides a solid foundation for addressing the challenges in satisfying legal and regulatory requirements, exploiting digital technologies, encouraging adoption of new technologies for operational environments and demonstrating safety and security.

1.2 Key Service Features

1. Maturity/compliance assessments against industry standards to understand current state
2. Formal assessments to support regulatory requirements including NIS Regulations
3. Risk and threat-based approach to identify critical operational assets
4. Development of strategy and policy documents to support regulatory compliance
5. Development/delivery of roadmap or change programmes to drive compliance improvements
6. Security Architecture review and developing reference models for change
7. Ensuring security is considered with “secure by design” principles
8. Supply chain security assurance
9. Privacy expertise to support compliance with regulation and data protection
10. Tailored personnel training and awareness.

1.3 Key Service Benefits

1. Identification of critical assets, systems and processes for business operations
2. Understanding the impact of disruption to business or service
3. Defining, designing and delivering controls to protect business operations
4. Exploitation of information to support operations and strategic planning
5. Development of resilient services to maintain operations in adverse conditions
6. Adaptive approach to align with regulations, standards and guidance
7. Improved performance through secure access to real time data
8. Minimising the impact of cyber security incidents
9. Continuously augment to exceed clients’ requirements and deliver value
10. Vendor agnostic and independent assessments aligned to industry standards.

1.4 Service Definition

Operational Technology (OT), also known as Industrial Control Systems, Industrial Control and Automation Systems, Supervisory Control and Data Acquisition or Distributed Control Systems, is typically present where a physical process needs to be controlled or monitored. A cyber-attack has the potential to cause major disruption through simple denial of service, misuse of the control system to change or shutdown processes, and to cause damage to equipment, the environment and endangering people.

Critical infrastructures such as energy, water, transport, critical manufacturing such as pharmaceuticals and food and defence platforms and infrastructure are all potential targets for high capability groups. We apply the principles from our IT focussed services to OT but ensure they are adapted to be appropriate in a live production environment to protect safety and operations. We help organisations improve the cyber security and resilience of their OT/ICS so critical operational assets can become part of connected digitalised processes without compromising security or regulatory compliance.

PA's capability is built on 20 years of globally recognised expertise in helping critical infrastructures, governments and regulators secure OT. The team has a deep understanding of the security challenges faced particularly in the operational domain and hold globally recognised certifications such as GICSP, IEC 62443, CISSP, CIIP and Offshore Certifications such as (BOSIET, HUET).

Particularly in critical infrastructures, PA works with governments and regulators to help define the requirements for OT security based on PA expertise and various standards and guidelines, such IEC62443, NIST CSF, NIS, OG86, ISO27019, IEC61508/15 as well as supporting the development of emerging standards such as IEC63452. We work with organisations to understand their security posture, the threats, vulnerabilities and the risk, and then develop and implement an improvement plan.

PA provides programme management, training, bringing IT and OT closer together and activities to improve the cyber security culture. Our approach is continuously being augmented with cross-industry experience to meet our client's requirements.

A key regulation for OT is the Network Information Systems Regulations (2018) which imposes a statutory obligation to protect essential services delivered by the healthcare, drinking water, oil and gas, energy and transport (aviation, rail, road and maritime) and digital service sectors from disruption caused by failures in security systems on which essential services rely.

The regulations set criteria to determine which organisations are "operators of essential services" in each sector. Those organisations that meet the criteria need to be able to demonstrate that they comply with the regulations. Across Europe, the regulations have been updated to Version 2.0 and PA are supporting European organisations who are in scope of these updated regulations, as well as tracking developments relating to the Cyber Security and Resilience Bill which will update them for the UK.

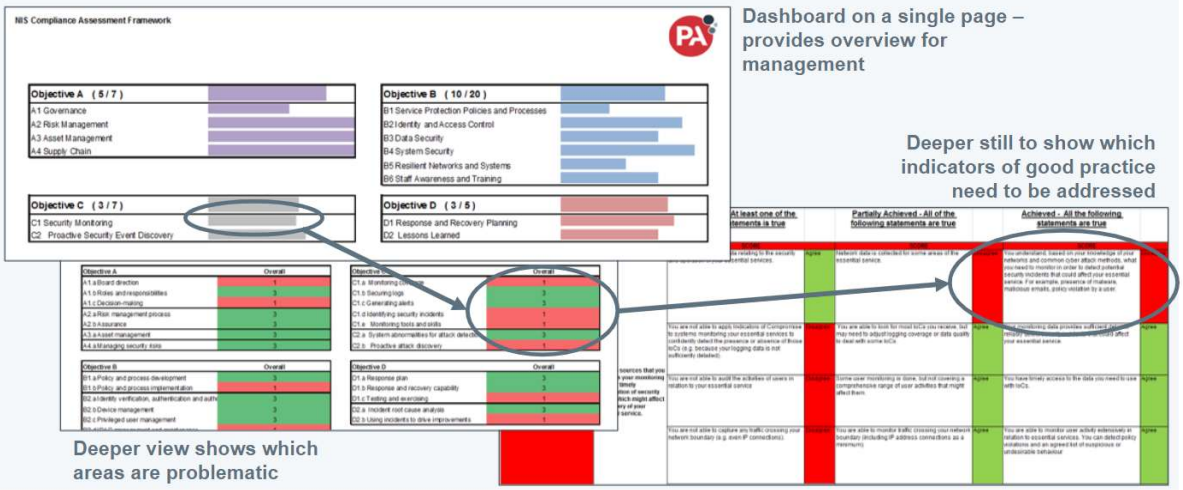
To support organisations with demonstrating compliance, PA has developed a compliance assessment framework tool, which adds value to the NCSC published Compliance Assessment Framework (CAF) by offering a simple dashboard and clear identification of risks and remediation actions. A sample of this tool is shown below. We also have and use similar tools based on other established and proprietary frameworks.

COMPLIANCE ASSESSMENT FRAMEWORK TOOL DEVELOPED BY PA

NCSC published a Compliance Assessment Framework (CAF)

PA developed a CAF tool which adds value through

- A simple dashboard to show the good areas and those needing improvement
- Identifies risks and recommended actions

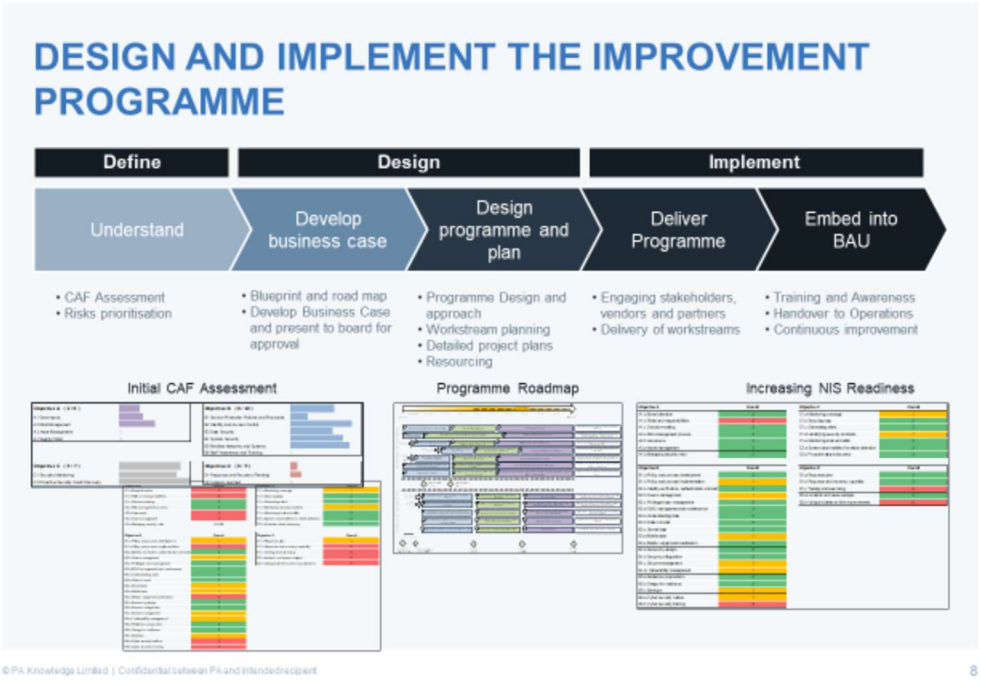


PA's service helps organisations demonstrate compliance and improve cyber security resilience by:

- **Managing security risk** - Organisations need to have structures, policies, and processes in place to understand, assess and systematically manage security risks to the systems which are critical to delivering essential services.
- **Protecting against cyber-attack** - Cyber security measures to protect essential services and systems from cyber-attack should reflect the level of risk. The organisation must define, implement, communicate and enforce appropriate policies, processes and security technologies to protect systems.
- **Detecting cyber security events** - Security monitoring of networks and systems is essential to ensure defences remain effective and to detect cyber security events affecting, or with the potential to affect, essential services. Prevention of cyber-attacks is desirable, but detection is essential if organisations are to have assurance their defences are effective, minimise impact of events, and evolve as the threats change.
- **Minimising the impact of cyber security incidents** - If an incident is detected, a defined and tested incident management process needs to be triggered to minimise impact and restore services quickly. To meet the regulations, the incident must be evaluated to see if it is a reportable incident and the competent authority notified if so, all within 72 hours of becoming aware of an incident.

Typically, we deliver security improvements and risk mitigations through a comprehensive improvement programme, which can be staged or phased.

Critically, the end goal of the programme is to embed the improved behaviours, processes or technology into the organisation as business as usual, resulting in increased NIS readiness and improved organisational resilience. The figure below shows a high-level example version of the programme.



1.5 Why PA Consulting Group (PA)? A trusted partner for cloud, AI, and digital technologies

PA Consulting Group (PA) is a leading technology and innovation consultancy and one of the UK government's most trusted advisors, combining strategy, delivery assurance and deep engineering to turn complex ambition into assured outcomes. We bring end-to-end capability across cloud architecture, data and AI, cyber, and advanced technology R&D, backed by a track record of scaling innovation in the public and private sectors.

Our UK work is anchored by secure, standards-led delivery. PA maintains ISO/IEC 27001 certification across global operations, demonstrating disciplined information security and operational control, and applies UK government good practice (GDS, NCSC CAF) across cloud and digital programmes.

We combine consultancy with real engineering. At our Global Innovation & Technology Centre (Cambridge), 300+ scientists, designers and engineers operate extensive labs and studios to prototype and industrialise solutions, bridging physical and digital from concept to production.

1.5.1 Why PA for cloud, data and AI

- **Hyperscaler alliances without vendor lock-in.** PA is Premier Tier with **Google Cloud** (13+ years; 150+ certifications; specialisations in infrastructure, data analytics, app dev and security) and holds deep **AWS** and **Microsoft** credentials, accelerating secure data foundations and generative AI at scale while keeping advice independent and outcome-led.
- **Responsible AI you can trust.** Our Responsible AI framework, governance toolkits, and risk policy make AI adoption transparent, auditable, and compliant, embedding lifecycle controls, model documentation, and human-in-the-loop safeguards aligned to evolving regulation.
- **Impact beyond pilots.** We help organisations become *intelligent enterprises*, using data and agentic AI to create and protect value, with pragmatic roadmaps from use-case selection to scaled operations.
- **Proof through delivery.** Our client stories span enterprise data platforms, IoT and analytics (e.g., Rentokil Initial), and product innovation at scale (e.g., Unilever) where PA has put data and AI at the heart of continuous, market-leading improvement.

1.5.2 Cloud capability (assess, design, build, assure, run)

PA applies an assured cloud delivery approach to complex government and regulated environments, blending client-side delivery assurance, multi-cloud architecture, and resilient operations:

- **Strategy & readiness.** Maturity assessments, target operating models for hybrid/multi-cloud, and cost/benefit modelling; proportionate GDS compliance and ISO 27001 controls embedded upfront.
- **Design & architecture.** Secure, well-architected patterns across Azure, AWS, and Google Cloud; data platforms, identity and access, and cross-domain solutions for sensitive estates.
- **Build & deploy.** Cloud-native engineering, DevSecOps (CALMR), CI/CD, infrastructure-as-code; automated testing and quality assurance to accelerate safe release.
- **Migration & modernisation.** Legacy transformation, platform reviews, and workload migration tuned to resilience and cost; pragmatic FinOps to keep spend predictable and efficient.
- **Operate & optimise.** Observability, incident management, performance tuning, backup/restore, and change management, maintaining business continuity and reducing total cost.
- **Client-side delivery assurance.** Forward-looking, risk-based assurance that keeps complex programmes on track, covering governance, architecture, testing, migration, service readiness and cutover. See our *IT Delivery Assurance* service.

1.5.3 AI, ML and data (from strategy to scale)

- **Strategy & governance.** AI blueprints, operating models, and policy; enterprise data governance; regulatory readiness; centre-of-excellence setup and change adoption.
- **Engineering & MLOps.** Data platforms on Azure/AWS/GCP, pipelines and feature stores; robust ML lifecycle with monitoring, drift detection and auditability.
- **Generative & agentic AI.** Secure integration of LLMs (including Copilot) into workflows for measurable productivity and quality gains, using guardrails, system cards and ROI framing.
- **Responsible AI.** Lifecycle controls and assurance tooling to manage bias, security and transparency.

1.5.3.1 Quantum and emerging technologies

PA's applied physics and quantum engineering teams help clients unlock near-term value, combining quantum techniques with classical systems for decision support, advanced sensing and secure communications:

- **Decision support & optimisation.** Hybrid quantum/classical algorithms to accelerate complex planning, routing and resource allocation where speed and quality of decisions matter.
- **Quantum sensing & RF.** Novel quantum radio and Rydberg-based sensing to enhance spectrum use, detection sensitivity and resilience in contested environments.
- **Commercialisation insight.** Advisory at the "whole-stack" level, hardware, supply chain, interfaces, and ethics, to move from lab to market within national strategies.

These capabilities are industrialised at our Cambridge centre, turning concepts into robust prototypes and pre-production systems across sectors like defence, energy and transport.

1.5.4 Cyber security and digital trust

Digital trust is central to PA's approach. We design security into architecture, operations and culture, aligning to NCSC CAF and GovAssure, and delivering testing, red-team, SOC design and OT/IoT security:

- **Transformation & architecture.** Secure-by-design patterns, cloud security, identity, and cross-domain data protection (including NCSC-approved Oakdoor data diode products).
- **Assurance & regulation.** CAF/GovAssure alignment and pragmatic remediation plans for government organisations.
- **Testing & resilience.** CREST-aligned penetration testing, red-teaming, incident readiness, and operational resilience.

1.5.5 What PA will bring

Ideation & Strategy

- Cloud strategy and advisory services
- Cloud readiness assessments
- Cost/benefit and ROI modelling
- Security and compliance by design.
- AI/ML and data strategy (blueprints, operating model, governance) with Responsible AI policy and guardrails.
- Quantum opportunity framing and whole-stack commercialisation roadmaps.

Design & Architecture

- Bespoke enterprise and cloud architectures
- Integration with existing IT infrastructures
- Hybrid/multi-cloud design
- Continuity and disaster recovery
- Data platforms and MLOps patterns
- Security, privacy and resilience embedded by design in technical designs
- User-centred-design
- Secure cross-domain solutions and high-side/low-side integration where required.

Development & Deployment

- Cloud-native engineering
- Containerisation, microservices and serverless
- DevSecOps (CALMR) with CI/CD and automated testing
- Generative AI and Copilot enablement with measurable productivity outcomes and run-controls.

Implementation & Migration

- Data migration and legacy modernisation
- Vendor selection and management
- Infrastructure-as-code with progressive, low-risk cutover.

Operations & Management

- Observability, incident management, SIEM/SOC design
- Performance optimisation and cost management (FinOps)
- Backup/restore
- User training and change adoption.

Innovation & Scaling

- Scalable cloud infrastructure to support growth
- AI/ML implementation and scaling
- IoT integration
- Ongoing innovation sprints and R&D, supported by our Cambridge engineering labs for rapid prototyping and pre-production.

1.5.6 PA is fully equipped to manage any challenges or requirements you may present

Across strategy, design, build and run, PA blends independent advice with hands-on engineering, operating to ISO 27001 and UK government standards, and backed by hyperscaler partnership depth. Whether the brief is modernising a sensitive cloud estate, industrialising AI responsibly, or de-risking a quantum-adjacent programme, we bring the multidisciplinary team to get from idea to reality, safely, quickly, and at scale.

1.6 A Genuine commitment to Social Value

At PA, we believe in the power of ingenuity to create a positive human future. Central to this ambition is our commitment to developing high-quality opportunities that enable individuals to acquire leading-edge skills, all within an environment that supports personal wellbeing and growth. We invest in our people through comprehensive training and development, ensuring they are fully prepared to tackle our clients' most complex challenges and advance their own careers.

We recognise that diversity drives innovation. Therefore, our recruitment practices are inclusive, welcoming individuals from all backgrounds. Every member of our team is empowered to reach their full potential through inclusive policies, processes, and a culture that is continuously improved using robust data.

We are passionate about creating genuine opportunities for those facing significant barriers to employment. Since 2023, our Digital Apprenticeship Programme has offered a Digital and Technology Solutions Degree through the University of Roehampton or Northumbria University. Our apprentices typically include first-generation professionals, college leavers, and individuals from ethnic minority backgrounds, many living in deprived areas. Additionally, we offer summer internships for undergraduates entering their final year, hosted at both our central London office and the Global Innovation and Technology Centre in Cambridge.

Economic responsibility is integral to our purpose. PA is accredited as a Living Wage employer, and where relevant, we ensure that our suppliers and subcontractors are paid at least the minimum living wage. We are also a signatory to the Prompt Payment Code, demonstrating our commitment to fair and responsible payments to suppliers.

Our carbon reduction targets have been validated by the Science Based Targets initiative (SBTi). We have a published carbon reduction plan and are committed to achieving carbon net zero by 2040, in alignment with PPN 06/21 criteria for UK public sector contracts exceeding £5 million. In 2024, we achieved a silver EcoVadis rating, reflecting our ongoing progress in sustainability.

We are dedicated to delivering targeted social value and will collaborate with you to determine the most effective approach for you, ensuring our efforts have the greatest possible impact.

1.7 Security Clearance

PA are fully compliant with industry best practices for information security, which includes compliance with the UK MOD Industry Personnel Security Assurance (IPSA) standard, against which we are independently audited every three years. PA also has multiple sites with FSC (previously List X) where our dedicated in-house Security Vetting team are based. This allows PA to achieve security vetting of its employees in a time effective manner ensuring the correct processes are always followed (In accordance with the Security Policy Framework/GS007). As a matter of standard process, PA puts all its eligible employees through the Baseline Personnel Security Standard (BPSS), set out by the Cabinet Office. Those employees working on, or planning to work on, government projects are automatically put forward for SC clearance which are processed via UK-SV (formally the Defence Business Services – National Security Vetting). PA also process DV vetting through the UK-SV and other agencies, these are generally client sponsored.

PA currently have a large pool of cleared individuals (80% of UK Staff). Should a resource be identified where clearance is needed, the PA Security Vetting team will then process the individual through the relevant clearance procedure. The team will also be able to validate all existing clearances held by PA employees when requested..

1.8 Next Steps

This service is intended to help customers develop and deliver successful outcomes regardless of the life cycle stage they are at. PA prides itself on working with clients and helping them to deliver outcomes whilst also providing them the ability to ‘stand on their own’ so that they can move their solutions forward without future involvement. Please contact us on GCloudFramework@paconsulting.com to discuss your needs further.

About PA.

We believe in the power of ingenuity to build a positive human future.

As strategies, technologies, and innovation collide, we create opportunity from complexity.

Our diverse teams of experts combine innovative thinking and breakthrough technologies to progress further, faster. Our clients adapt and transform, and together we achieve enduring results.

We are over 4,000 strategists, innovators, designers, consultants, digital experts, scientists, engineers, and technologists. And we have deep expertise in consumer and manufacturing, defence and security, energy and utilities, financial services, government and public services, health and life sciences, and transport.

Our teams operate globally from offices across the UK, Ireland, US, Nordics, and Netherlands.

PA. Bringing Ingenuity to Life.

Discover more at paconsulting.com and connect with PA on LinkedIn and X.

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