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Victorian Transmission System 2023-2027 access arrangement proposal. Revised proposal

Operational Technology Program for VTS

August 10, 2022

Contents

1. Introduction

1.1. What is Operational Technology?

Operational Technology (OT) is the connection of site equipment to the remote facility. This technology is required to operate any physical plant in the field. Some key responsibilities OT has at APA's include:

- Automatically controlling equipment on site
- Enabling digital lock-outs on site to ensure field staff can safely perform maintenance
- Field staff to take control of the site if required
- Remote staff to operate the site.

OT is also used to meter the connections to the customer and provide the data to the commercial systems to ensure customers are billed correctly.

Additional to these services, operational technology is used to collect data and present to operators and engineers to make other decisions such as:

- When equipment requires servicing
- When the plant is not operating as expected
- Manage APA's fleet of assets.

OT is an essential support to the business physical operation of sites to maintain safety and reliability of services, as well as supporting commercial operations through the collection of customers metering data.

1.2. Stakeholder engagement

The VTS stakeholder engagement group were presented with information about the Information and Operation Technology programs and the key drivers for the expenditure requirements.

Feedback we received from the stakeholder engagement group, was to ensure that the technology program was proportionate and efficient. The stakeholders sought assurance that proposed expenditure was efficient and that the APA wide costs were being allocated to VTS in a fair, reasonable and transparent manner.

We have sought to address these issues in this paper.

1.3. AER Draft Decision

The AER's Draft Decision was to not accept APA's initial proposal. The AER stated that while APA described at a high level why it considered the expenditure was justified, it did not:

1. describe or provide evidence of what was obsolete or needing a routine upgrade
2. what was required to be cloud based, or
3. which technologies would no longer be supported.

This paper provides further information about the Operational Technology program and the proposed capital expenditure forecasts.

2. Primary investment drivers

The 2023-27 OT program and projects are ongoing upgrades and replacement of assets and services. The operational technology program is driven by:

- **Safety, reliability, integrity.** Compliance with the AS2885 the Standard for Gas and Liquid Petroleum Pipelines
- **Obsolescence**. End of life equipment is equipment that is no longer supported by the vendor, and equipment that no-longer has available replacements. In the event of equipment failure the likelihood is that the sites will become inoperable if not replaced
- **Improving asset lifecycle.** Improving data to enable better management of assets to have a longer lifespan. This information is used to support Asset Management to improve the safety and integrity of services. The data helps Asset Management comply with legislative requirements and relevant pipeline standards (AS2885)
- **Reliability.** Reducing impact to customers of service interruptions by improving ability to respond to faults including provision of data to engineers to interrogate faulty assets.

The AS/NZS 2885 The Standard for Gas and Liquid Petroleum Pipelines is the foundation on which the petroleum pipelines industry which represents good industry practice. It is a driver for gas transmission operations programs and operational technology.

These are the primary drivers for making investment decisions to support proper functioning of Information Technology.

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3. Governance of the Operational Technology portfolio

APA's has recently refreshed it technology strategy to ensure that it remains consistent with APA's corporate strategy. This refresh has updated and introduced 6 guiding principles to shape and steer information technology.

3.1. Guiding Principles

The principles guide behaviours in selecting, creating, and implementing what Enterprise Program Management Office (EPMO) to support APA business outcomes.

The APA information technology program has six guiding principles
- Enabling Business Transformation - We are strategically aligned, generating shareholder value rapidly. Business agility is paramount.
- Customer & Experience Centric - We work in partnership and collaborate. We look to smarter ways of working and rapid application delivery to support business growth.
- Safe & Secure - Cyber Security is by design, aligned to board risk appetite and we are regulatory compliant.
- Fit For Purpose Solutions - We work together to deliver operational resilient and fit for purpose solutions. We adopt rather than adapt.
- Optimise For Efficiency - We optimise the business and focus on operational efficiencies. We always consider the long-term benefits and test, learn and iterate with agility.
- Data Leveraged as a Critical Asset - We believe in actionable analytics, leveraging trusted data capabilities to deliver insights and help our business see the future.

Broadly this can be represented in the table below

Figure 1: Excerpt from technology strategy

1. Enabling Business Transformation We are strategically aligned, generating shareholder value rapidly. Business agility is paramount. *We deliver consistent measurable outcomes.*		**4. Fit For Purpose Solutions** We work together to deliver operational resilient and fit for purpose solutions. We adopt rather than adapt. *We are strategically a cloud-first business.*	
2. Customer & Experience Centric We work in partnership, and collaborate. We look to smarter ways of working and rapid application delivery to support business growth. *We prioritise customer experience and user-centricity.*		**5. Optimise For Efficiency** We optimise the business and focus on operational efficiencies. We always consider the long-term benefits and test, learn and iterate with agility. *We reuse > buy > build in that order.*	
3. Safe & Secure Cyber Security is by design, aligned to board risk appetite and we are regulatory compliant. *We Protect, Detect, Respond and Recover.*		**6. Data Leveraged as a Critical Asset** We believe in actionable analytics, leveraging trusted data capabilities to deliver insights and help our business see the future. *We manage enterprise data as a critical asset.*	

This strategy operates in conjunction with the EMPO project and governance framework to identify, prioritise and deliver APA's IT program.

APA's IT program is undertaken consistent with APA's EPMO Project & Program Governance. This governance framework is described in *VTS – APA EPMO Project & Program Governance Overview – August 2022 – Public.*

3.2. Enterprise Program Management Office

The EPMO is responsible for ensuring projects deliver optimum business value as early as possible and ensuring a continuous improvement focus by creating safe spaces to innovate, learn fast and adjust where required.

APA is embarking on transforming critical applications and IOT infrastructure to bring them up to modern good industry practice-standards. The benefits of this transformation will provide better services to customers, enhancing the digital customer experience, and providing timely and more accurate information.

3.3. Operational Technology assessment process

Decision-making for investment in Operational Technology follows APA's portfolio management approach:

- All projects include a high level summary to assess and compare
- All projects include a business case which includes options assessment details. Projects being delivered for business groups require that the business groups participate in benefits assessment to ensure correct assessment
- Options assessments typically take into consideration options such as: do nothing, do different solution, reduced solution. Options are assessed as to the most effective solution
- Large projects undergo a plan & design phase prior to delivery to ensure project costs and solution is feasible and functional.

4. Operational Technology program

There are 12 operational technology programs and projects planned for the 2023-27 access arrangement period. VTS is allocated a proportion of the APA-wide OT costs based on the regulatory cost allocation method.

In most cases VTS is allocated 8.21 % of total corporate costs. This method was covered in the initial proposal. However, in some cases VTS is allocated a proportion of cost more reflective of its use - which we have explained in the following sections.

Operational Technology capital expenditure forecasts by program & projects that have been allocated to VTS are presented below.

Table 1 Operational Technology programs & projects and capital expenditure forecasts ($2022, $millions)

Programs & projects	Unit	2023	2024	2025	2026	2027	2023-2027
lifecycle management	$2022	287,350	287,350	197,040	225,775	246,300	1,243,815
Lifecycle - SCADA and HMI Systems	$2022	630,000	560,000	0	0	0	1,190,000
unlock grid constraints	$2022	16,420	82,100	82,100	82,100	82,100	344,820
OT Services uplift	$2022	20,394	80,048	80,048	86,205	86,205	352,900
Alarm Excellence	$2022	61,575	66,825	57,470	-	-	185,870
Facilities Engineering Data Uplift	$2022	45,155	41,050	41,050	41,050	41,050	209,355
OT Lifecycle	$2022	80,190	53,365	20,525	41,050	41,050	236,180
Integrity Data	$2022	41,050	24,630	24,630	-	-	90,310
Version Dog Expansion and Uplift	$2022	24,630	24,630	-	-	-	49,260
VTS AEMO Serial to IP connections uplift	$2022	-	50,000	150,000	-	-	200,000
OT Cyber	$2022	121,262	131,601	-	-	-	252,862
Remote Sites Connectivity Uplift	$2022	24,630	24,630	24,630	24,630	24,630	123,150
Total		**1,352,655**	**1,426,229**	**677,493**	**500,810**	**521,335**	**4,478,522**

Figure 2 OT programs & projects as proportion of total OT program
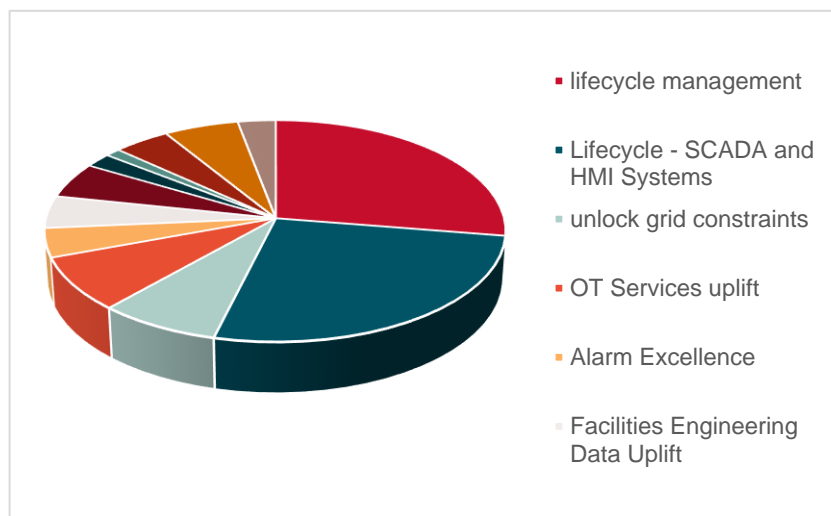
As shown in the above table and figure the Lifecycle Management program is the most significant program with the Operational Technology Function representing 28% of the total capital expenditure forecast. The table below sets out the key deliverable for each of the OT programs and projects.

Table 2 Operational Technology program and project benefit summary deliverables

Program	Investment driver	Summary of benefits
Lifecycle Management ($1.2m)	Obsolete communication service Comply with AS2885.3	Continued operations – end of life communications services require replacement to ensure operations of site can continue. Ensure continued performance, reliability and support.
Lifecycle – SCADA and HMI ($1.2m)	Obsolete assets Comply with AS2885.3	Reduced Risk (Safety and operational) – ensuring site can be safely operated on site and remotely
Unlock grid constraints ($0.3m)	Safety & reliability	Reduced Risk (Safety and operational) – uplifting code in site control to ensure site is operating safely.
OT Services Uplift ($0.4m)	Reliability & data quality	Improved regulatory data quality, reduced risk – Improving underlying systems to be more consistent and able to accurately report data without losses or data outages
Alarm Excellence ($0.2m)	Safety & reliability	Reduced Risk (Safety and operational) – ensuring site control systems takes correct action to protect site safety when alarms activate, ensuring operators can make correct operational decisions
Facilities Engineering Data Uplift ($0.2m)	Reliability & data quality	Reduced Risk (Operational) – using additional equipment data to predict or rapidly respond to faults to minimise duration and severity of outages
OT Lifecycle ($0.2m)	Obsolete assets & services	Reduced Risk (operational) – identifying and acting on end of life equipment and systems to ensure sites stay operational
Integrity data ($0.09m)	Safety, reliability & integrity	Reduced Risk / Increased pipeline lifetime – connecting, reporting integrity data to provide engineers information to manage pipeline integrity.
Versiondog Expansion and Uplift ($0.05m)	Reliability	Reduced risk (operational) – secure copies of code enables rapid response to issues and restarting site operations in case of equipment failure
VTS AEMO Serial to IP connections uplift ($0.2m)	Obsolete assets	Capability uplift – replacement of legacy connections to ensure operations can be maintained securely
OT Cyber ($0.3m)	Safety, reliability, integrity	Reduced Risk (security) – Review, uplift and Installation of OT Cyber services to protect sites from cyber threats.
Remote site connectivity uplift ($0.1m)	Reliability	Capability uplift – improvement of bandwidth to sites to ensure other technologies on site can operate such as ability to support site remotely.

5. Operational Technology program business cases

The programs described in the following sections have been subject to business cases and options assessment.

The descriptions below are a short summary of information to provide context behind the benefits claimed but do not provide a full description that is otherwise included in the existing initiative proposals and business cases.

5.1. Lifecycle Management program (SCADA WAN Hardware)

Project description

This program is specifically targeting the lifecycle of SCADA WAN. Supervisory Control and Data Acquisition (SCADA) systems are an essential part of VTS communication systems required to operate the VTS effectively and safely.

This asset ensures communication is functioning between site and remote operations (Integrated Operations Centre and Data centres). VTS spans a wide area across Victoria with many assets located in remote areas. This lifecycle replacement is required for the sites to continue to be remotely operable.

Program	Summary of benefits
Lifecycle Management (SCADA WAN Hardware)	Continued operations – end of life communications services require replacement to ensure operations of site can continue. Ensure continued performance, reliability and support

Project need and primary driver

The Lifecycle Management program (SCADA WAN Hardware) is driven by the need to address obsolescence of communications systems.

APA has critical communication services that provide communication between remote sites and centralised operational technology systems. The SCADA WAN communication systems enable monitoring and control of APA assets.

The primary driver of the Lifecycle Management program is address technology assets reaching end-of-life. There is a risk that if the SCADA WAN hardware cannot connect to a satellite then the integrated operations centre will not be able to meet the obligations of AS2885.3 Section 8.9. This standard requires the capability to use supervisory control and data acquisition.

Migration or upgrading of communication equipment needs to occur before the assets reach their end-of-life date. The transition from old to new is necessary to allow seamless and uninterrupted communications between central operational technology and remote sites.

The key strategic benefit of the SCADA WAN Hardware Lifecycle Program is to ensure the currency of the WAN communication at remote and accessible sites to monitor and maintain the APAs key asset.

The Lifecycle Management program (SCADA WAN Hardware) project has been initiated as a result of third-party communications technology obsolescence. The project is needed to prevent service interruption to SCADA WAN.

These services that are subject to the Lifecycle Management program (SCADA WAN Hardware) project and are impacting VTS are as follows:

- ADSL services decommissioning under the NBN rollout schedule. Targeted implementation FY22/23
- Skywire satellite gateways end of life and in extended support. Targeted implementation FY22/23
- Telstra 3G decommissioning June 2024. Targeted implementation FY22/23.

For each of the (above) services being decommissioned, affected sites undergo a hardware carriage review. The results of the review determines which carriage will be selected from the available carriages in the area. The on-site hardware is selected to match the selected carriage. (Eg. Satellite network routers).

Table 1 - Classification of site, alignment to IT Incident Process and availability targets

Site Class	Support Coverage	IT Incident Priority	Support Response (Contracted SLA)	Agreed Target Restoration	Availability Target %	Expected Downtime Hours / Year
HC1	24/7	P2	30 min	4 hours	99.9	8.45
HC2	24/7	P2	30 min	4 hours	99.9	8.45
HC3	Business hours	P3	3 hours	1 day	99.5	43.49
HC4	Business hours	P4	8 hours	5 days	99	87.39
HC5	Business hours	P4	Best efforts	Best Efforts	N/A	N/A
HC6	Business hours	P4	Best efforts	Best Efforts	N/A	N/A
HC7	Business hours	P4	Best efforts	Best Efforts	N/A	N/A

There is a risk of adverse impact to operations if these communications services are allowed to lapse as this would result in a loss of ability to monitor and control APA assets. The objective is to ensure there is no extended duration loss of access to the asset.

The program commenced in FY22 to ensure sufficient time to deploy new services prior to expiration of legacy services.

Benefit realisation

During the 2023-27 access arrangement period, APA VTS allocation of lifecycle management costs will total $1.2 million. This expenditure is necessary to maintain communication services to assets on the VTS.

Investing in the communications will reduce the risk of access to assets. The benefits realisation/ risk reduction that are forecast to be derived from the project are shown in the following table.

The risk to APA's customers is an outage resulting in a loss of supply of gas. Loss of remote operation will result in a requirement for field staff to physically attend site and use satellite radio communication to set up site to operate in the intended way. This is not a feasible form of operation due to sites being remote.

Table 3 Benefits realisation of Lifecycle management program

Benefit Type	Benefit	Baseline	Target
Risk	Risk reduction (maintaining communication)	High risk	Low risk

How cost has been estimated

The majority of the work being performed will be done by APA staff and individuals contracted to APA. The methodology for estimating the project cost is based on a combination of market-based costs and past costs for similar work.

Costs have been estimated based on:

- Quotations for new physical equipment
- Prior year costs associated with APA labour to perform replacement of equipment on site
- Number of sites requiring upgrade.

Options considered

The two options considered:

1. Do nothing. Not replacing obsolete SCADA WAN hardware
2. Upgrade SCADA Wan Hardware to enable communication with third-party

The following options have been analysed to achieve the outcomes that will address the business problem(s).

Option 1: Do nothing

Option 1 do nothing would involve APA not replacing obsolete equipment.

This is not a credible option. There is no option for extended support and the vendors are decommissioning the affected satellite equipment.

This option would likely result in a breach of AS2885.3 section 8.9 which requires an operable supervisory control and data acquisition system.

The consequence of not upgrading the obsolete assets would impact on APA's ability to perform asset maintenance of the network. Maintenance of the network is necessary to ensure continuity of communications to each site for the purposes of providing regulatory and compliance data, and to be able to nominate gas supply to customers and/ or manage key financial systems.

This option would result in high risk to APA's communication capabilities and is not acceptable nor credible.

Option 2: SCADA Wan Hardware Asset Lifecycle Management Program

Commence the SCADA Wan Hardware upgrade to ensure continuity of services. The benefit of Option 2 would be to reduce risk from High Risk under Option 1 to Low Risk.

Option 2 would involve

Objectives	
1	Stand up 3rd Teleport hub to transition sites over to new satellite service ensuring no loss of redundancy in the network.
2	Transition Thaicom4 (TC4) sites to new MeaSat service
3	Transition 3G sites to 4G before June 2024 (Telstra 3G network shut down date)
4	Transition ADSL service off the Telstra copper network to Clear Fixed Wireless Service
5	Upgrade obsolete equipment
6	Bring sites that currently have no communication SLAs under new Ursys MSA.

These services allow APA to perform asset maintenance of the network to ensure continuity of communications to each site for the purposes of providing regulatory and compliance data and be able to nominate gas supply to customers or manage key financial systems.

The program commenced in FY22 to ensure sufficient time to deploy new services prior to expiration of legacy services.

Consistency with the National Gas Rules

Consistent with the requirements of Rule 79 of the National Gas Rules, APA considers that the capital expenditure is:

- Prudent – The expenditure is necessary to upgrade SCADA WAN assets in response to third party communications providers decommissioning obsolete services. APA needs to upgrade assets in order to maintain the safety, reliability and security of APA VTS assets. [Compliance with Standards? It is of a nature that a prudent organisation would incur

- Efficient – The work is being carried out in sufficient time to replace and upgrade before end-of-lie. The works will be subject to APA procurement policy and be carried out by a suitably

qualified external contractor. The expenditure can therefore be considered consistent with the expenditure that a prudent organisation acting efficiently would incur

- Consistent with accepted and good industry practice – Maintaining communications equipment and services is accepted as good industry practice. In addition, the reduction of risk to as low as reasonably practicable in a manner that balances cost and risk

- To achieve the lowest sustainable cost of delivering pipeline services – The sustainable delivery of services includes reducing risks to as low as reasonably practicable.

5.2. Lifecycle SCADA and HMI

Project description

APA uses Supervisory Control and Data Acquisition (SCADA) systems to manage and monitor real time, and historical site data. Site data and information is accessed via an operator interface, local SCADA system (GE iFix, Schneider ClearSCADA   Citec, Wunderwear and Siemens). Whereas the Integrated Operations Centre (IOC) remotely monitors sites using Schneider GeoSCADA.

Local operator interfaces are disparate and at some sites reaching end of life and will be obsolete. They suffer constant failures that impact both IOC and local operators. The local SCADA and HMI have inconsistent software, hardware systems, cyber security standards and support arrangements.

Program	Summary of benefits
Lifecycle – SCADA and HMI	Reduced Risk (Safety and operational) – ensuring site can be safely operated on site and remotely

Project need and primary driver

The OT Lifecycle – SCADA and HMI Program commenced in June 2020. This is a multi-year program and was established to deliver a planned uplift deployment to all existing sites, prioritised by criticality. Therefore, the OT Lifecycle – SCADA and HMI Program key objectives are to:

- Improve and standardise the security for local SCADA.
- Improve and standardise the way local SCADA is implemented.
- Improve, standardise, and simplify Local SCADA infrastructure.
- Migrate existing legacy HMI and Local SCADA to National GeoSCADA platform.
- Simplify work processes for interpreting site asset monitoring data (operator interface consistent).
- Improve and simplify future APA Asset upgrades.
- Running sites with APA OT supported software so that local SCADA and HMI are on a supported OT platform
- Compliance with AS2885.3.

The total sites this program will address is approximately 52 legacy asset locations. As at June 2022, 22 site locations have been completed and 2 sites in progress. (70% of costs of the total program are allocated to VTS based on the assets requiring upgrade / replacement).

Options considered

The following options have been analysed to achieve the outcomes that will address the business problem(s).

Option 1: Do nothing

The cost of the option

No additional capital expenditure.

The expected benefit

None.

This option was discounted because:

This option is not recommended because the issues with current state will continue to exist, risks will increase over time and the project benefits will not be realised. The Don Nothing options is not compliant with AS2885.3.

Option 2: Deliver the SCADA and HMI Upgrades (Recommended)

The cost of the option

The total cost of this option is based on prior year internal labour used to perform the upgrade work

This option will deliver:

This option will deliver:

- Real time asset monitoring and alarms data which will improve safety for field staff locking out equipment on site.
- Standardised of how the IOC operate monitoring for all APA sites.
- Simplified and efficient remote site operations from the IOC.
- Enhance ability for IOC to communicate with field staff on site asset troubleshooting.
- Reducing the risk of unexpected site asset equipment trips.
- Simplify work processes for interpreting site asset monitoring data (operator interface consistent).
- Improve and simplify future APA Asset upgrades.
- The ability to run sites with APA OT supported software so that local SCADA and HMI are on a supported OT platform.

This option was recommended because:

- This is the recommended option because the risks and performance issues associated with the current states are unacceptable to the business on an ongoing basis and must be addressed.
- To comply with AS2885.3 section 8.9 the system shall be operated and maintained.

5.3. Unlock grid constraints

Project need and primary driver

This project is focused on increasing capacity and throughput of pipelines as well as identifying limits that should be reduced to maintain operations within safe operating limits.

Program	Summary of benefits
Unlock grid constraints	Reduced Risk (Safety and operational) – uplifting code in site control to ensure site is operating safely.

This is a new initiative. The project is aimed at reducing the control system risks with the current configuration. The current situation is reacting to faults or constraints that restrict operations entirely or partially.

- Faults in the control system can prevent site operations
- Faults in the control system may require a trip to site to rectify resulting in extended outages
- Faults in the control system may result in restricted flows until underlying code can be investigated by an engineer.

Options considered

Options considered included:

- Do nothing
- Undertake grid constraints project

This project option assessment identified that the control systems require a program of work to rectify known issues and identify risks and hazards in sites where issues are probable but currently unknown.

5.4. OT Services Uplift

This is a project focused on capability uplift between OT systems to ensure when sites are built, upgraded and maintained within the systems they become more consistent with APA's operating model.

Program	Summary of benefits
OT Services Uplift	Improved regulatory data quality, reduced risk – Improving underlying systems to be more consistent and able to accurately report data without losses or data outages.

Benefit realisation

This project is to uplift the OT systems ability to utilise templates between multiple OT systems. This will help identify and prevent data quality issues. The uplift includes a new tag data design system to the whole data lifecycle can be managed more effectively.

The new service includes a replacement of existing FAT/SAT documentation with a consistent systemised approach to ensure both upgrade and new designs are performed in a way that is auditable and simple to measure that the design process has correctly fixed all issues identified.

5.5. Alarm excellence

Project need and primary driver

Alarm excellence project is aimed at improving the performance of the network alarm systems within the operation centre. The project is aimed at high consequence events that may be avoided by the alarms project with significant impacts damaged equipment should these alarms be missed. The key drivers for the alarm excellence project are safety and reliability.

Program	Summary of benefits
Alarm Excellence	Reduced Risk (Safety and operational) – ensuring site control systems takes correct action to protect site safety when alarms activate, ensuring operators can make correct operational decisions.

Benefit realisation

Alarm Excellence is a continuing program and is aimed at addressing several issues:

- Overload of alarms - resulting in missed alarms by the controllers
- Missing alarms (not showing)
- Consistency with what is being alarmed
- Controller actions
- Alarm set-point management and approval.

Recently, alarm standards have been/ are being updated. In the 2023-27 access arrangement period, more sites will be rationalised using these standards.

An important part is design standards and reducing alarm design time for projects. The project will deliver tools and processes to assist with this and develop a standard approach for future alarm.

5.6. Facilities Engineering Data Uplift

Project need and primary driver

The objective of the facilities engineering data uplift program is to reduce the amount of time it takes to get site operational again after a trip.

When a trip occurs, an engineer will have ready to access data from the equipment that has tripped such that a decision can be made about what needs to be done to get the site operational again as fast as possible.

The driver for this program is improving service reliability by using additional equipment data to predict or rapidly respond to faults to minimise duration and severity of outages.

Program	Summary of benefits
Facilities Engineering Data Uplift	Reduced Risk (Operational) – using additional equipment data to predict or rapidly respond to faults to minimise duration and severity of outages

Benefit realisation

This is a continuing program.

The existing situation (compared as the 'do nothing' option) is a requirement for field staff to visit site and re-create the trip scenario to attempt to capture the data manually about the event. The existing operational cost and impact to customer is significant.

To solve this problem site equipment will have new data capture devices attached and connected to the existing APA historian system.

5.7. OT Lifecycle program

Project need and primary driver

The OT Lifecycle project is driven by the need to replace obsolete equipment and services.

Program	Summary of benefits
OT Lifecycle	Reduced Risk (operational) – identifying and acting on end of life equipment and systems to ensure sites stay operational.

This program includes two projects:

1. OT Systems Capacity, Lifecycle Review and Refresh
2. OT Data Quality uplift.

Benefit realisation

The OT Systems Capacity, Lifecycle Review and Refresh project is necessary because various OT Field devices are near or past their operational lifetime. The risk of old equipment is the inability to operate if a failure occurs. Investment to avoid obsolescence of OT and ensure Core RTU platform is fully supported includes:

- New tag licences
- RTU lifecycle review, including
  - Systems capacity review
  - Obsolescence assessment.

The OT Data quality uplift project is aimed at fixing between connecting between OT systems.

5.8. Integrity data

Project need and primary driver

The objective of this program is to ensure pipelines planned lifetime is maintained or extended.

Pipeline lifetime is significantly impacted by corrosion. This program assists with the connection of data through to Asset Managers to ensure corrosion protection can be effectively monitored and managed.

Benefit realisation

Program	Summary of benefits
Integrity data	Reduced Risk / Increased pipeline lifetime – connecting, reporting integrity data to provide engineers information to manage pipeline integrity.

This project is part of a large long term program.

Cathodic Protection Data Model and Pipeline Asset Condition

There are thousands of data loggers connected in the field, this project seeks to connect, sort and analyse the data and make it available to the engineers.

The benefits of the cathodic protection data model project includes:

- Efficiency – improve maintenance strategies by providing better maintenance data
- Efficiency – less travelling to take measurement
- Effectiveness - improved decision-making (less asset damage with better condition monitoring and maintenance)
- Regulatory requirements.

Four key objectives of the project:

- Maximise capability of cathodic protection engineering resources to assist in early identification of poorly protected pipeline segments
- Maximise capability of cathodic protection visualisation to the IOC to ensure relevant actions are taken and irrelevant information is removed/hidden
- Provide detailed information to Asset Management and senior leadership on each asset's current protection state
- Provide justification for operational and capital expenditure for managing each asset's protection state.

Pipeline Integrity data framework

This project is foundational to Reliability Centred Maintenance for pipeline integrity. Benefits are similar to CP project, but this project addresses all the other types of data that are required to ensure pipeline integrity projects can be scheduled and performed effectively.

It is part of larger integrity project that has a business case:

- Efficiency (not quantified) - Integrity engineers spend hours/days preparing data and this will reduce this time
- Risk reduction - Standard way of assessing pipeline risk to ensure highest risk assets have projects performed first
- Capex reduction - Integrity projects such as dig ups, pipeline coating, cut outs and capacity reduction cost the company millions every year. Better data could lead to reduction (e.g. dig ups that could be avoided 5-10 per year)
- Regulatory Compliance – Better documentation will help comply with regulatory obligations.

5.9. Versiondog Expansion and Uplift

Project need and primary driver

The Versiondog system (an existing APA system) contains copies of the code for field devices that control sites. This code needs the latest version backed up and available to the people that require access to it. The project is driven by the need to ensure reliability and rapid response to outages.

Program	Summary of benefits
Versiondog Expansion and Uplift	Reduced risk (operational) – secure copies of code enables rapid response to issues and restarting site operations in case of equipment failure

This project minimises the risk of a device failure resulting in a prolonged outage.

This project's scope is to ensure all devices are captured within the system and to expand the capability of the system to ensure there is adequate information about devices to perform rapid response to issues.

5.10. VTS AEMO Serial to IP connections uplift

Project need and primary driver

This is a project to upgrade the AEMO existing direct connections to APA's field devices to enable control and metering. The project is driven by the need to replace legacy systems reaching end of life

Program	Summary of benefits
VTS AEMO Serial to IP connections uplift	Capability uplift – replacement of legacy connections to ensure operations can be maintained securely

Benefit realisation

The new solution will use modern protocols and ensure a reliable, secure and supportable connection can be maintained. This will enable AEMO to use a supportable connection to manage in the SCADA system.

5.11. OT Cyber

Project need and primary driver

The OT Cyber program's purpose is to protect sites from cyber threats. This program is separate to the SOCI program.

Program	Summary of benefits
OT Cyber	Reduced Risk (security) – Review, uplift and Installation of OT Cyber services to protect site's from cyber threats.

Benefit realisation

The program includes major categories of work including:

- Networks
- Systems
- Security.

For major scope items, reviews have been conducted to ensure prioritisation of the program to maximise the risk reduction.

- **Networks.** Improving network connectivity to sites including quality of service improvements (Prioritisation of data to ensure sites can be securely controlled during high bandwidth periods).
- **Systems.** Installing tools to manage windows PCs installed in the field. This will ensure old PC cyber security threats are removed or appropriately managed.
- **Security.** Installation of monitoring and logging tools to ensure we can detect and respond to cyber security threats.

5.12. Remote site connectivity uplift

Project need and primary driver

The remote site connectivity uplift project is driven by the need to improve reliability by uplifting internet connectivity to improve effectiveness of site monitoring and access to data.

Program	Summary of benefits
Remote site connectivity uplift	Capability uplift – improvement of bandwidth to sites to ensure other technologies on site can operate such as ability to support site remotely.

Benefit realisation

The ability for field staff to connect to the internet and access site documentation, SCADA and other services is essential to ensure staff can safely perform their work from site. Engineers attempting to remotely support sites require a reliable connection to be able to connect and review the behaviour of the control system and site.

The project will improve site connections that require upgrades to ensure sites can be adequately supported.

5.13. Operating expenditure

The VTS APA will be allocated new and incremental operating costs for new software support and maintenance. The new and incremental APA VTS Operational Technology operating expenditure forecasts are forecast to be negligible and have not been resubmitted.

6. Operational Technology program is prudent and efficient

6.1. Meeting National Gas Rules, Rule 79

Consistent with the requirements of Rule 79 of the National Gas Rules, APA considers that the capital expenditure proposed for the OT portfolio of programs is:

- Prudent – The expenditure is necessary in order to enable VTS to support financial reporting systems, market systems and asset management systems. These are systems integral to the proper functioning of an energy business. Upgrading and maintaining information technology is critical to maintaining the safety, reliability and security of VTS services. The program is necessary to maintain and improve the safety of the public and personnel. The proposed expenditure is of a nature that a prudent organisation would incur.
- Efficient – The OT program is being carried out in sufficient time to replace and upgrade before end-of-life to ensure to disruption to operations. The works will be subject to APA procurement policy and be carried out by suitably qualified external contractors and consultants. VTS benefits from economies of scale and scope relative to have to incur OT costs on a stand-alone basis. APA is subject to market scrutiny and greater discipline to minimise costs that slows on to a benefit for customers. The program expenditure (based on current information) is consistent with the expenditure that a prudent organisation acting efficiently would incur.
- Consistent with accepted and good industry practice – Maintaining information, communications and operational technology is accepted as good industry practice. APA operations with AS 2885. APA seeks to reduce risk to as low as reasonably practicable in a manner that balances cost and risk. The projects are conducted consistent with Australian and International IT standards and frameworks.
- To achieve the lowest sustainable cost of delivering pipeline services – The sustainable delivery of services includes reducing risks to as low as reasonably practicable.

Glossary

CAM	Cost Allocation Methodology
EC	Energy Components
EPMO	Enterprise Program Management Office
HMI	Human Manual Interface
IaaS	Infrastructure-as-a-Service
IFRIC®	IFRIC Interpretations Committee
IOC	Integrated Operations Centre
IP	Intellectual property
IT	Information Technology
OT	Operational Technology
PaaS	Platform-as-a-Service
SaaS	Software-as-a-Service
SoCI	Security of Critical Infrastructure