

Real-time services support

Regulatory Business Case
FY2028–32 System Control and Market
Operator Charges Review

Contents

1.	Overview	2
2.	Identified need	4
3.	Options	6
3.1	Options assessment	6
3.2	Cost assessment	8
3.3	Recommended option	8

4.	Strategic Alignment and Delivery	10
4.1	Strategic Alignment	10
4.2	Dependent projects	11
4.3	Deliverability	11
4.4	High-level scope	12
4.5	Residual Risks and Management Approach	13

1. Overview

NTESMO, as the system operator for the Darwin–Katherine Power System (DKPS), is responsible for providing the real-time monitoring, control, and decision-support capabilities necessary to maintain power system security and reliability. This service includes operation and management of the Supervisory Control and Data Acquisition (SCADA) front end of the GE e-Terra Energy Management System (EMS), as well as the associated operational applications, including custom SCADA calculations and other bespoke EMS applications.

The EMS supports critical operational functions, including real-time network visibility and demand management, generator dispatch and control, and the integration of renewable energy resources into system operations. Given the increasing complexity of the power system — driven by higher penetrations of inverter-based resources, reduced system inertia, and tighter operational security margins — the continued availability, performance, and integrity of the EMS is critical to maintaining secure system operation.

The EMS operates continuously on a 24/7 basis and serves as the primary operational tool within the control room. Due to its critical role, any degradation in system availability, performance, or data accuracy can significantly impact the ability of operators to maintain safe and reliable system operations. System disturbances or failures may reduce situational awareness, delay or compromise contingency response actions, increase operational and system security risks, and potentially result in non-compliance with the Secure System Guidelines and other regulatory obligations.

EMS support is currently delivered through arrangements with Power and Water Corporation's (PWC) Power Services and Power SCADA team, supported by a mix of internal capability and external vendor services. However, the absence of formalised service definitions, performance measures, and accountability introduces elevated operational risk, particularly in relation to real-time system support, incident response, and continuity of service. As the power system's complexity continues to increase, these risks have the potential to impact system reliability and NTESMO's ability to meet its system operator obligations.

Strategically, NTESMO must ensure that EMS support arrangements are aligned with its current and future role as system and market operator, particularly as operating models and organisational responsibilities continue to evolve. Although NTESMO has been working with Power Services, as the EMS asset owner, to establish Service Level Agreements (SLAs), current real-time support is primarily provided by the Power SCADA team and may change in the near future. This creates a clear need to proactively define NTESMO's business requirements and formalise EMS service level and governance arrangements. Doing so will reduce operational and transition risk, provide clarity of accountability, and establish a scalable and resilient EMS support model that can adapt to future system and market developments.

Table 1 Annual capital and operational expenditure (\$million, real FY2025)

	FY28	FY29	FY30	FY31	FY32	Total
Capex	0	0	0	0	0	0
Opex	1.63	1.63	1.63	1.63	1.63	8.15
Total	1.63	1.63	1.63	1.63	1.63	8.15

This regulatory business case has been prepared on the basis of real \$FY2025 and all figures are in \$FY2025 unless otherwise stated. For the purposes of the FY2028–32 System Control and Market Operator Charges Review Initial Proposal, the annual capital and operational expenditure have also been escalated and presented in forecast \$FY2027 dollars and classified by NTESMO function and regulatory cost category as per the table below.

Table 2 Annual capital and operational expenditure (\$million, real FY2027)

Function	Cost Category	FY28	FY29	FY30	FY31	FY32	Total
System Control	Residual Costs	1.64	1.64	1.64	1.64	1.64	8.18
Market Operator	Residual Costs	0.12	0.12	0.12	0.12	0.12	0.59
Total	-	1.75	1.75	1.75	1.75	1.75	8.77

Note: Numbers may not add due to rounding.

2. Identified need

The maintenance of real-time system security is fundamental to NTESMO's capability to perform its statutory obligations under the System Control Technical Code and Secure System Guidelines. To meet these obligations, NTESMO must have confidence that the Energy Management System (EMS) – the primary tool for real time system monitoring, control, and dispatch – is consistently available and capable of supporting secure system operations.

EMS performance requirements

The system operator is required to maintain the EMS platform and its operational applications to a high standard of performance and availability, due to their critical operational role in maintaining system security and real-time power system operation. This includes the core EMS infrastructure, the SCADA front end, real-time databases, communication interfaces, and essential operational applications such as state estimation of the network, dispatch, and reserve monitoring.

Any unplanned outage or loss of critical EMS functionality can significantly impair the ability of operators to monitor network conditions, manage contingencies, and maintain system security. The availability target of at least 99.999% uptime per month with minimum downtime reflects the mission-critical nature of the EMS and is consistent with good utility practice for real-time operational systems. This target allows for minimal unplanned downtime while recognising that planned maintenance activities may be required and can be excluded when appropriately scheduled and approved.

In addition to availability, low and predictable end-to-end latency is critical to ensuring that control room operators receive timely and accurate information, and that dispatch and control actions are executed within acceptable operational timeframes. Excessive latency can delay operator response, degrade control effectiveness, and increase operational and system security risk, particularly during rapidly evolving system conditions or contingency events. For example, generator dispatch latency is required to be ≤ 6 seconds to support the timely execution of dispatch and control actions, including generator setpoint changes and operational instructions.

Together, EMS availability and latency performance form core indicators of real-time EMS operational health. Meeting these performance targets provides assurance that the EMS is fit-for-purpose to support secure system operations, particularly under high renewable penetration, low inertia conditions, and during contingency events.

Gaps in real-time EMS support

NTESMO does not currently have a formal, fully funded, and accountable real-time EMS support model in place that is tailored to its system control obligations. While the performance requirements are well understood, EMS support is currently delivered informally by the Power SCADA team as an ancillary part of its network responsibilities, without NTESMO-specific service definitions, performance measures, or commercial accountability.

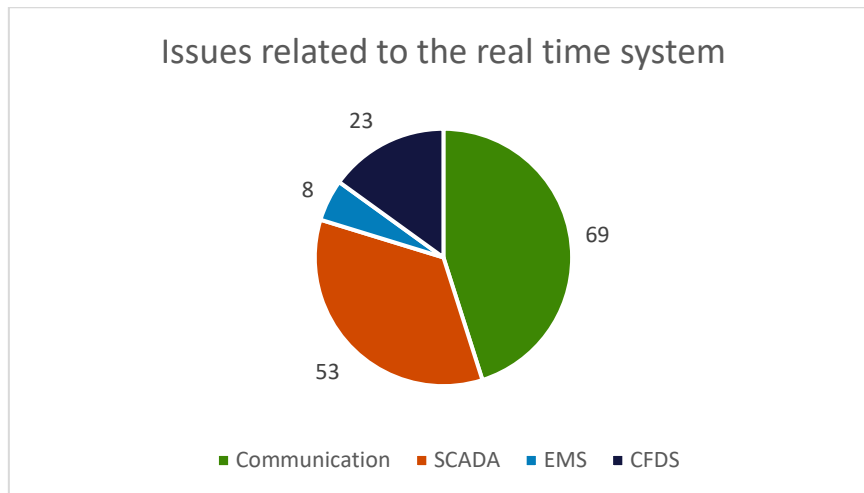
Under this informal arrangement, the Power SCADA team provides business-as-usual support as required in response to operational issues or for scheduled preventative maintenance. This includes:

- 24/7 real-time EMS operational support for system control
- Fault diagnosis, resolution, and incident management
- Monitoring and maintenance of the EMS platform and applications

- SCADA front-end support and communications modelling

Operational experience over the twelve-month period to December 2025 demonstrates that real-time system support is frequently required to assist the control room. As shown in Figure 1, the majority of incidents relate to communication issues, followed by SCADA-related failures such as loss of generator visibility or missing SCADA data.

Figure 1. Distribution of real-time system issues requiring operational support from the SCADA team (December 2024 to December 2025)



These issues directly impact the system control operators' situational awareness and ability to safely and effectively operate the power system, increasing the likelihood of delayed decision-making and elevated system security risk.

The current support model exposes NTESMO to ongoing operational and compliance risk for a mission-critical system. There is no approved funding for NTESMO to contribute to the cost of existing Power SCADA support, nor to expand the scope of services to meet the full requirements of System Control. Continued reliance on informal, unfunded, and non-contractual arrangements does not provide adequate assurance of service continuity, performance, or compliance.

To meet system control obligations and support secure, reliable operation of the real-time system, NTESMO requires a broader and more formalised support capability, including:

- Support for EMS applications including dispatch, AGC, custom EMS applications, and custom SCADA calculations
- Fault diagnosis, resolution, and incident management.
- Change and configuration management aligned with operational requirements
- On-call and after-hours support arrangements
- Performance reporting against agreed service levels.

Accordingly, funding is required to establish a formal, accountable, and scalable real-time EMS support model, including SLAs, governance, and performance reporting, that aligns with NTESMO's system security obligations and supports secure, reliable operation throughout the FY2028–32 period.

3. Options

To address the identified need, two options were considered, including the base case. Table 3 provides a summary of the options for the provision of real-time support services.

Table 3: Summary of options for real time services

Options	Description
Option 1: Business as usual with SLA and Agreement with PWC	Option 1 involves leveraging the existing agreement by extending its scope to include additional functionality and responsibilities for PWC to provide services to NTESMO. This service arrangement would continue following the separation between NTESMO and PWC. Option 1 provides benefits to NTESMO through minimal changes to existing services and operational arrangements. This approach provides a high level of service assurance and continuity, as only limited training and familiarisation would be required. It also reduces the risk of system downtime and operational disruption during the transition period.
Option 2: Third Party Arrangement	Option 2 involves establishing a third-party arrangement to provide real-time EMS support. This option would require a transition period to allow for knowledge transfer and familiarisation with the PWC systems and operational environment. In addition, Option 2 would continue to require ongoing support from the Power SCADA team, resulting in a more complex support model during and potentially beyond the transition phase.

3.1 Options assessment

This section describes the options that were analysed to address the increasing risk and identify the recommended option. The options are analysed based on the ability to address the identified need.

Table 4: Summary of options analysis

Assessment metrics	Option 1	Option 2
Net Present Value (\$'000, real FY2025)	N/A	N/A
Net Present Cost (\$'000, real FY2025)	N/A	N/A
Benefit Cost Ratio (BCR)	N/A	N/A
Capex (\$real FY25)	N/A	N/A
Opex (\$real FY25)	1.63 M	1.63 M
Meets customer expectations	●	●

Technical Viability	●	◐
Deliverability	●	◐
Preferred	✓	✗

- Fully addressed the issue ◐ Adequately addressed the issue ◑ Partially addressed the issue ○ Did not address the issue

3.1.1 Option 1 – Business as usual with SLA and Agreement with PWC

Under Option 1, NTESMO would leverage the existing service agreement with PWC by extending the scope to include full real-time EMS operational support services for NTESMO. The service arrangement would continue following the organisational separation between NTESMO and PWC and would include:

- 24/7 real-time EMS operational support
- Monitoring and maintenance of the EMS platform and applications
- SCADA front-end support and communications monitoring
- Incident management, fault diagnosis, and resolution
- Support for EMS applications including dispatch, AGC, custom EMS applications, and custom SCADA calculation
- Change and configuration management aligned with operational requirements
- On-call and after-hours support arrangements
- Performance reporting against agreed service levels.

This option assumes continued access to existing systems, processes, documentation, and operational knowledge held by PWC. Option 1 provides a high level of service continuity with minimal disruption to current operations. As the existing service provider is already familiar with the EMS environment, system architecture, and operational practices, only limited additional training or knowledge transfer would be required.

This option reduces the risk of service degradation during the transition period and minimises the likelihood of unplanned outages or operational incidents associated with changes in support arrangements. It also provides greater confidence in meeting EMS availability and latency performance targets from commencement.

Risks and Considerations

- Ongoing reliance on PWC as the primary service provider.
- Potential limitations in flexibility or cost optimisation compared to a competitive market approach.
- Requirement to clearly define and formalise service levels, accountabilities, and governance arrangements post-separation.

3.1.2 Option 2 – Third Party Arrangement

Under Option 2, NTESMO would procure real-time EMS support services from an independent third-party provider. The scope would include:

- Provision of real-time EMS operational support services including 24/7 support
- Incident response and fault management

- EMS application support and maintenance
- Support for system monitoring and performance management
- Transition support, including knowledge transfer from PWC and Power SCADA team.

However, due to system ownership, architecture, and operational dependencies, ongoing support from the Power SCADA team would still be required, particularly for field communications, system changes, and specialist EMS functions.

Option 2 may provide opportunities for increased commercial competition and access to alternative technical expertise. Over the longer term, this option could support greater flexibility in service delivery models. However, this option would require a significant transition period to enable knowledge transfer, system familiarisation, and operational readiness. During this transition, NTESMO would be exposed to increased operational risk due to reduced system familiarity and the complexity of a multi-party support arrangement.

Risks and Considerations

- Transition time increased and implementation risk.
- Longer timeframes to achieve full operational effectiveness.
- Ongoing dependency on Power SCADA support, resulting in a more complex operating model.
- Higher risk of service fragmentation and unclear accountability during incidents.
- Potential risk to EMS availability and performance during early stages of operation.
- Potential security breach and data leak due to outsourcing operation.

3.2 Cost assessment

The estimated ongoing cost for option 2 is estimated to be \$1.63 million per year. This has been derived from a third-party quote for the provision of comparable services¹. In the absence of an approved internal cost model, the cost estimate for option 1 is assessed to be the same as for option 2. The annual capital and operational expenditure for both options through FY32 is presented in Table 5.

Table 5 Annual capital and operational expenditure (\$million, real FY2025)

	FY28	FY29	FY30	FY31	FY32	Total
Capex	0	0	0	0	0	0
Opex	1.63	1.63	1.63	1.63	1.63	8.15
Total	1.63	1.63	1.63	1.63	1.63	8.15

3.3 Recommended option

Option 1 provides lower risk, a shorter implementation time, and less disruption to support for real-time EMS operations when compared to Option 2. Option 1 further offers clear advantages in terms of service continuity, system familiarity, and reduced transition risk. It is more likely to ensure that EMS availability, latency, and operational performance targets are met and support NTESMO's system security obligations.

¹ The supporting quote is provided in the attachment.

While Option 2 may offer potential long-term flexibility or commercial benefits, these are outweighed in the short to medium term by increased transition risk, operational complexity, risk of security breaches, and reliance on multiple support parties. This option would require additional governance controls and risk mitigations to achieve an equivalent level of operational assurance.

Option 1, Business as Usual with an SLA and formal agreement with PWC, is therefore assessed to be the most prudent and cost-effective approach. It leverages existing service arrangements and capabilities while formalising performance expectations, accountability, and service continuity through defined SLAs. Compared to alternative options, Option 1 minimises implementation and transition risk, avoids significant upfront capital investment, and provides a predictable and sustainable operating cost profile. The proposed expenditure is considered affordable within current funding constraints and delivers value for money by strengthening service reliability and operational assurance without introducing unnecessary complexity or duplication of capability.

4. Strategic Alignment and Delivery

4.1 Strategic Alignment

Power and Water's Strategic Plan has two overarching goals – modernising our business and embracing a sustainable future with innovation. This proposal aligns with both of these goals and their constituent objectives as indicated in Table 6.

Table 6: Alignment with Power and Water's Strategic Plan

Goal	Objective	Alignment
Modernising our business	Delivering sustainable value safely and reliably for our customers and community	- Provides a structured approach to cybersecurity uplift, meeting critical infrastructure obligations and minimising exposure to compliance risks - Reliable SCADA data exchange supports EMS applications (State Estimation, Contingency Analysis, AGC, custom and bespoke applications) - Clear delineation between baseline obligations and service provision prevents disputes and supports predictable budgeting for both Network Service Provider (NSP) and System Control - Avoids duplication of SCADA and EMS infrastructure, leveraging shared services where practical to reduce overall cost burden
	An empowered and high performing workforce	
	Successful investments in core systems and capability to improve efficiency and value of service	
Embracing a sustainable future with innovation	Structuring, facilitating & enabling infrastructure and innovations that support the: - Renewable energy transition - Achievement of economic growth targets	- A structured funding model ensures adequate resources to meet obligations professionally and sustainably, supporting long term reliability and compliance - Provides a clear framework for SCADA and EMS responsibilities, adding future structural reforms without operational disruption - Creates foundation for advanced analytics, renewable integration, and enhanced forecasting by ensuring robust data exchange and system visibility - Ensures compliance with mandatory data provision requirement under NER clause 4.3.2 and 5.7.4 reducing risk of regulatory breaches and penalties - Formal agreements and services catalogues clarify roles, responsibilities, and funding
	Proactively adopting government policy for a clean and secure energy future	
	Partner with customers and stakeholders to create innovative solutions	

		arrangements, fostering collaboration between NSP, System Control and regulator • Demonstrate proactive risk management and compliance, reinforcing confidence in NT's power system governance
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4.2 Dependent projects

- Not Applicable.

4.3 Deliverability

This step change in operational expenditure is required to ensure that NTESMO can continue to maintain the agreed service levels and that the teams responsible for delivering these critical services are adequately resourced throughout the forthcoming regulatory period. The program of work will deliver the structures and processes necessary to support a consistent, transparent, and sustainable service delivery model.

Key outcomes of this investment include:

- Formalisation of baseline and enhanced service tiers to clearly delineate core obligations from optional or higher service offerings.
- Development of a comprehensive service catalogue, including defined SLAs, performance metrics, and reporting obligations.
- Establishment of clear cost allocation and funding arrangements, ensuring transparency between NSP obligations under the Australian Energy Regulator (AER) framework and System Control obligations under the Utilities Commission (UC) framework.

Delivery Timeline

FY2026–2027

- Establish the overarching governance framework to support long term service delivery.
- Undertake structured stakeholder engagement to validate service expectations and obligations.
- Develop service catalogues, key performance indicators (KPIs), and detailed SLAs.

FY2028–2032

- Implement the new SLAs and associated service tiers.
- Conduct regular monitoring of performance against agreed targets.
- Hold monthly governance reviews to ensure accountability, transparency, and continuous improvement throughout the period.

Customer considerations

In accordance with the UC's requirements, NTESMO has actively incorporated customer feedback throughout the development of this program.

The proposed budget expenditure, presented as an ongoing step change commencing in FY2028, was tabled during the Public Consultation on the Draft Regulatory Proposal held on 11 December 2025.

Stakeholders acknowledged the proposal, with no objections raised regarding the rationale or associated costs.

To ensure funding arrangements are robust and transparent, NTESMO engaged both the asset owner and the senior manager for Operational Technology. This consultation confirmed that the funding model will align with two distinct regulatory processes:

- NSP obligations under the AER framework; and
- System Control obligations under the UC framework.

4.4 High-level scope

This program will deliver a structured, sustainable, cyber security SOCI Act compliant SCADA/EMS service framework through a multi-year set of activities spanning design, governance establishment, implementation, and ongoing operational assurance. The high-level scope is outlined below:

A. Service Level Agreement Design Activities (FY2026-27)

- Develop and formalise baseline and enhanced service tiers, defining clear roles, responsibilities, and regulatory obligations.
- Build a detailed service catalogue, including SLAs, performance metrics, and reporting requirements.
- Develop the cost allocation model distinguishing between NSP obligations (AER regulated) and System Control obligations (UC regulated).
- Engage stakeholders (Asset Owner, OT leadership, internal operations) to validate service expectations and refine governance and accountability structures.
- Establish the overarching governance framework, including decision pathways, ownership structures, and reporting lines.

Outcome: complete and endorsed framework that specifies what services will be delivered, expected performance, and how funding will be allocated.

B. Delivery (FY2028–32)

This phase implements the service tiers, SLAs, operational processes, and cyber-resilience improvements.

- Deploy enhanced SLAs and begin operational execution of the service catalogue.
- Implement infrastructure enhancements (ICCP redundancy, gateway upgrades, cyber monitoring).
- Conduct monthly governance reviews to track performance against KPIs, resolve issues, and ensure SLAs are being met.
- Implement Security of Critical Infrastructure (SOCI) uplift controls, including segmentation, privileged access control, incident response procedures, and assurance testing.
- Undertake resilience exercises and reporting cycles aligned to regulatory requirements.

Outcome: Fully operational service delivery model with ongoing performance management and continuous improvement.

C. Ongoing Maintenance and Assurance (FY2028–32 and beyond)

- Sustaining service quality and compliance with NER, SCTC, and SOCI obligations.
- Continual monitoring of SCADA/EMS service levels.
- Regular reporting of KPIs and SLA compliance.
- Annual assurance activities and independent audits (e.g. SOCI, cyber controls, service performance).
- Scheduled refresh of service catalogues and cost allocations to ensure alignment with future market and regulatory changes.

Outcome: A sustainable operating model that supports long term system security, compliance, and customer transparency.

4.5 Residual Risks and Management Approach

Even with the preferred approach, several residual risks remain. These will be actively managed as part of the program.

Residual Risk

- Dependence on NSP data quality and availability may affect SLA performance.
- SOCI uplift complexity may introduce scope adjustments.
- Resource availability constraints across NTESMO, SCADA, EMS and cybersecurity teams.
- Evolving regulating requirements potentially altering obligations mid cycle.

Residual Management Strategy

- Monthly governance meetings to identify and resolve performance and compliance risks early.
- Annual SLA and service review to ensure ongoing alignment with regulatory changes.
- Multi-year workforce and capability planning to ensure sufficient SCADA/EMS and cyber security capacity.
- Continuous monitoring, incident exercises, and third-party assurance testing to validate SOCI readiness.

Appendix A. Cost estimation

Due to the lack of approved cost model at the time of the initial NTESMO Regulatory Submission, the cost estimate in this regulatory business case is based a third-party quote for such services.

Appendix B. Governance Framework

The program will operate under a structured governance model comprising:

- Executive Sponsor: NTESMO Leadership
- Program Steering Committee: Asset Owner, System Control, OT Leadership, Finance and regulatory representatives
- Operational Working Group: SCADA, EMS, Cybersecurity, SME representative from NTESMO
- Monthly governance and performance review cycles addressing SLAs, risks, dependencies and compliance.

Table 7 RACI Matrix

R	A	C	I
Responsible	Accountable	Consulted	Informed

Area	Power Services (EMS Owner)		NTESMO (System Operator-User)		Participants
EMS/SCADA platform and apps	R	A	C	I	I
	Operate, patch, upgrade, capacity		Define ops needs, validate		
ICCP data exchange	R		C		I
	Configure associations, TLS/certs, monitoring		Define datasets/peers, approve windows		
Telemetry transport (Intervening Facilities)	R		C		I
	circuits, routers, concentrators		Set performance; escalate incidents		
Plant-side RME/RCE	I		A		R
			Operational enforcement		Install / maintain, provide telemetry
Security and resilience	R		A		I
	Cyber controls, backup power, incident reporting		Policy and oversight		
	R		C		I

DR and failover	DR tests, RTO/RPO	Approve plans; witness tests	
Change and testing	R	A	C
	Plan/test/implement; confirm compliance pre-go-live	Accept changes; provide ops scenarios	
Incident management per SLA timers	R	A	C
	Triage/restore/comms priorities	Declare Major Incident; coordinate ops	Support site restoration

Appendix C. Assumptions

- **Baseline SCADA Obligations**

Baseline SCADA functions and standard telemetry services remain funded through the Network Service Provider's (NSP) regulated revenue allowance, with no direct payments required from System Control for these mandatory obligations.

- **Enhanced and Non-Standard Services**

Any enhanced services—such as additional ICCP links, increased resilience measures, cybersecurity uplift components, or bespoke EMS integrations—will require separate negotiated agreements and project-specific funding arrangements.

- **Ownership and Cost Allocation for SCADA/EMS**

Power Services retains ownership of both the SCADA system and the EMS licensing. The NSP uses EMS for network operational purposes, while System Control relies on EMS for system security, system operations, and dispatch functions. As a result, compute, applications, and maintenance costs associated with EMS constitute shared services and will be allocated using an agreed, transparent, and robust cost allocation methodology.

- **Regulatory Framework Stability**

It is assumed that the current AER and UC regulatory frameworks will remain consistent, with baseline obligations funded through standard regulatory determinations and enhanced services delivered through negotiated mechanisms.

- **Resourcing and Capability Adequacy**

Both the NSP and System Control are assumed to have, or be able to secure, sufficient technical capability and resourcing to operate SCADA systems, interface effectively with EMS applications, and support required cybersecurity uplift and assurance activities.

- **Cost Savings**

Licensing costs will be shared between NTESMO and the EMS asset owner post-separation. This arrangement is expected to reduce NTESMO's ongoing operational costs. Any resulting budget adjustments will be undertaken following the finalisation of the post-separation arrangements.

- **Adjustment for the revenue model from NSP.**

The revenue model associated with NSP will be reviewed and adjusted following the separation of NTESMO and PWC. This adjustment will reflect the revised operating arrangements, roles, and cost recovery mechanisms post-separation.

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