

**NERC**

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# Compliance Monitoring and Enforcement Program Technology Project

Business Case for ERO Enterprise IT Investment

November 16, 2017 – Approved

April 2020 - **Updated**

Prepared by ERO Project Management Office

**RELIABILITY | ACCOUNTABILITY**



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## April 2020 Executive Update

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In order to support appropriate continuing levels of project oversight, this business case was reviewed and updated in April of 2020 to reflect the impact of delays related to the resolution of various NERC, Regional Entity, and registered entity concerns. As a part of that, the financial analysis was updated as follows:

- 1.) The model was updated to reflect actual investments to date for years 2017-2019.
- 2.) The model was updated to reflect current future investment forecasts for years 2020 and beyond.
- 3.) The model was updated to use staffing counts and salaries from the 2020 Business Plan and Budget documents, reflecting the dissolution of the SPP and FRCC Regional Entities.
- 4.) Elimination of fees paid for CITS, CDMS, and CRATS was delayed from 2021 to 2022.
- 5.) Overall labor savings were reduced by 33% across the board to more conservatively evaluate the benefits identified in the business case
- 6.) Additionally, based on the development of the Secure Evidence Locker, a reevaluation of labor savings was undertaken to remove the benefits of exchanging and collaborating on certain entity evidence and documents within Align. Using labor data provided by the regions in 2018 and 2019 related to the areas of key benefit accrual identified for Align, three tasks are expected to be impacted:
  - a. Manually Preparing and Exchanging Data and Documents with Registered Entities (benefits assumed to reduce by 50% based on SEL)
  - b. Manually Preparing and Exchanging Data and Documents Internally with Other Departments or with Other Regions (benefits assumed to reduce by 25%, based on use of SEL and adoption of enhanced documentation processes)
  - c. Manually Preparing and Exchanging Data and Documents with NERC (benefits assumed to reduce by 25%, based on use of SEL and adoption of enhanced documentation processes)
- 7.) Combined, items 6 and 7 above reduced the average expected efficiency gain for impacted ERO Enterprise staff from 7% down to 4%.

As would be expected, the delays considered above also delayed the accrual of benefits associated with the project implementation. These adjustments resulted in positive ROIs in five of the nine considered scenarios over seven years (as opposed to five in five years in the original case), with eight of the nine scenarios positive in ten years (as opposed to nine in nine years). Break-even year is now estimated as 2023 (compared to 2021 in the original case), and maximum break-even is 2026 (compared to 2023 in the original case).

## Executive Summary

With the ERO Enterprise at a critical point in its maturation, the Compliance Monitoring and Enforcement Program (CMEP) Technology Project is a strategic opportunity to significantly improve the productivity and effectiveness of the ERO Enterprise, and will provide benefits to all those impacted by our work: registered entities, Regional Entities, and NERC. This enterprise-level program will support the following objectives:

- Protect and maintain the reputation of the ERO as a credible regulator through consistent and objective implementation of generally accepted professional standards and best practices, as well as requirements established through the Rules of Procedure (RoP)
- Ensure consistency in practices and data gathering by aligning common CMEP business processes across the ERO Enterprise
- Increase productivity of compliance work activities for registered entities as well as across the ERO Enterprise through easier data entry and access to information, as well as through the use of workflows and collaboration tools
- Enhance the effectiveness of the ERO Enterprise by increasing its ability to share and analyze reliability risk and compliance information across NERC and the Regional Entities
- Reduce total combined NERC and Regional Entity IT capital investments and maintenance costs for CMEP-related applications. Current annual licensing and maintenance fees across the ERO Enterprise is \$1.1M

Once implemented, the new solution will give NERC and the Regional Entities a greater level of visibility into identifying and managing reliability risk. The ability to catalogue and manage reliability risks across North America will combine with the ability to see those risks within the context of compliance trends, performance analysis, and forward-looking assessments. Together, these elements will provide deep and broad views of reliability across the ERO Enterprise, leading to new insights into data-informed reliability risk management. Such visibility is essential to the continuing maturation of the ERO Enterprise and the achievement of our reliability mission.

**Table 1 - Program Information at a Glance**

<b>Program Name</b>	CMEP Technology Project
<b>Portfolio</b>	ERO Enterprise
<b>Executive Sponsors</b>	<ul style="list-style-type: none"> <li>• Jim Robb, President and CEO, NERC</li> <li>• Sara Patrick, President and CEO, MRO</li> <li>• Jim Albright, Vice-President and COO, Texas RE</li> </ul>
<b>Project Sponsors</b>	<ul style="list-style-type: none"> <li>• Sonia Mendonça, Senior Vice President, General Counsel and Corporate Secretary, NERC</li> <li>• Stan Hoptroff, Vice President and CTO, and Director of Information Technology, NERC</li> <li>• Mechelle Thomas, Vice President and Director of Compliance, NERC</li> </ul>
<b>Program Areas</b>	Compliance and Enforcement
<b>Project Type</b>	New Functionality
<b>Total Estimated Capital Investment</b>	\$6-7.5M, completing in 2021
<b>Estimated Annual Operating Costs</b>	\$553k per year over eight years (2018-2025)
<b>Estimated Return on Investment</b>	2023 (year 7), based on medium cost and medium benefit estimates used in cost/benefit analysis
<b>Stakeholders</b>	NERC, Regional Entities, and registered entities
<b>Proposed Timeline</b>	2017-2021

## Strategic Opportunity

The CMEP Technology Project is a culmination of strategic efforts that began in 2014 with the goal of improving and standardizing processes across the ERO Enterprise. As the ERO Enterprise matures to use a risk-based approach in its regulatory posture for the CMEP, the need to develop a more comprehensive system to manage and analyze information is more acute. The ERO Enterprise has great discretion in the development of its regulatory oversight and enforcement – and it is essential that we show that discretion is exercised with due care and in a competent manner. Without a robust, comprehensive system, verifying the effectiveness of ERO Enterprise oversight of the almost 1,500 registered entities becomes more difficult with the reliance on a patchwork of tools and information spread across the eight Regions and NERC. Regional and NERC senior management require a mechanism to provide assurance that these risks are managed through a comprehensive system benchmarked around well understood processes designed to prevent regulatory failures.

While a number of past efforts focused on improving the effectiveness of various processes used in compliance monitoring and enforcement, the tools used in the execution of those processes largely rely on the technology skills of compliance and enforcement staff. Other than the enforcement processing systems (webCDMS, CITS and CRATS)<sup>1</sup>, a number of manual processes are used in place of a single, enterprise-class system. As a result, much of the CMEP staff spends time creating, updating, and maintaining these manual processes. The result is less time available for the central mission of reliability risk management and control.

At the same time, registered entities face a regulatory environment in which the information they provide and the way performance is measured can change depending on the location of the assets they own or operate. The organic growth of regional tools and best practices across North America led to small differences in implementation that, while achieving the same goals, create additional cost and complexity in terms of complying with the Reliability Standards. Lacking a common foundation upon which to judge compliance, auditor expectations in different Regions can be inconsistent. In some cases, evidence judged as sufficient in one Region may be seen as questionable or insufficient in another.

The reliability goals of the ERO Enterprise drive the execution of the CMEP. Roughly 39 percent of the resources across the ERO Enterprise are focused on Compliance and related enforcement activities, making it the highest area of resource allocation. Given the high allocation to these responsibilities, the need to seek opportunities for ways to improve the productivity and effectiveness of the ERO Enterprise is clear.

The NERC Information Technology team, working with thought leaders from both NERC and the Regional Entities, developed a vision and roadmap to move away from the mix of approaches and toward a single, common system to support ERO Enterprise needs and increase consistency across the ERO. During the past two years, the ERO Enterprise investigated, validated, and refined this approach. As a result, the ERO Enterprise seeks to identify and implement a common, best-in-class system that

ERO Enterprise Resource Allocation to Strategic Goal Areas

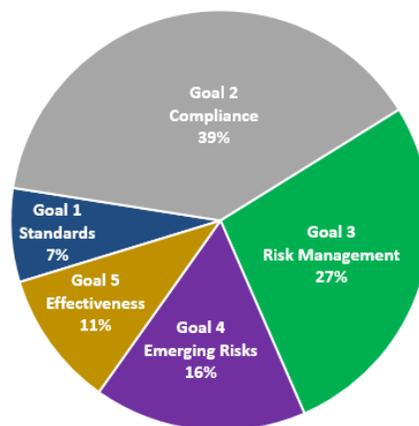


Figure 1

<sup>1</sup> The OATI Web Compliance Data Management System (webCDMS), the Guidance Compliance Information Tracking System (CITS), and the Guidance Compliance Reporting and Tracking System (CRATS).

aligns with audit and risk-management industry best practices. Such alignment will help ensure the operational success of the ERO, while moving the ERO Enterprise to a technology that is routinely enhanced and updated based on audit industry improvements and lessons learned.

Recognizing the magnitude of this endeavor, a governance group comprised of leaders from both NERC and the Regional Entities was assembled to select a consulting partner to help guide the ERO Enterprise through this next phase in its maturation. Through a robust evaluation process, the team chose Deloitte Consulting to serve as this guide. Identified as a visionary leader in Risk Management Consulting Services, based on both its ability to execute and the completeness of its vision in the Gartner Magic Quadrant<sup>2</sup> report, Deloitte was retained by NERC to drive the adoption of common business process and practice in the CMEP, and to assist in identifying a tool that will best serve the needs of the ERO Enterprise. Deloitte will also assist in driving the overall implementation effort.



Figure 2 - Gartner Magic Quadrant for Risk Management Consulting Services, Worldwide

Through this solution, operational information will be available across the ERO Enterprise as CMEP activities unfold. This will eliminate the delays and complexity associated with exchanging information between systems as we do today, as well as reducing the manual work that goes into collecting and exchanging non-standard data both among Regional Entities and between Regional Entities and NERC. Moving to a common solution will enable both NERC and the Regional Entities to do more detailed reporting on risk trends and operational analysis, further increasing productivity and effectiveness, and provide new ways to undertake research and analysis of compliance performance and reliability risks.

Beyond information analysis, alignment of the chosen solution with audit industry best practices and tools will provide additional benefits. Annual planning, entity-specific audit planning, and actual compliance monitoring will be facilitated by a system designed and purpose-built to support these processes, leading to increased productivity and effectiveness.

## Stakeholder Involvement

In addition to the benefits for the ERO Enterprise, moving to a common tool benefits registered entities, as well. When implementation is complete, the new system will provide a standardized interface through which registered entities can interact with the ERO Enterprise. This will help ensure consistency of processes, templates, and communications during the implementation of the CMEP, reducing both the perception of inconsistent treatment and the corporate risk associated with those perceptions.

<sup>2</sup> From [Magic Quadrant for Risk Management Consulting Services, Worldwide](#), 5 November 2015. This graphic was published by Gartner, Inc., as part of a larger research document and should be evaluated in the context of the entire document. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner's research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

Additionally, registered entities will also be able to use data and information from the new system to help evaluate and manage their own reliability risk. This will build on the existing feedback mechanisms and provide greater functionality in this area than that which exists today.

The project team will solicit stakeholder input through a series of communications and outreach through the various stakeholder groups, including the Compliance and Certification Committee (CCC), the Member Representatives Committee (MRC), and other relevant committees and subcommittees, as appropriate. Specifically, the project team will solicit feedback regarding current legacy system challenges and opportunities that this initiative should address.

The reputation and credibility of the ERO Enterprise relies on the ability to demonstrate that authority and discretion are used in the public interests to maintain the reliability and security of the bulk power system. The remaining sections of this business case provide additional detail and further explain the rationale for moving forward with this endeavor.

# Business Opportunity Assessment and Analysis

## Current State

Since 2007, the Regional Entities and NERC developed their own processes and systems to support the mission of the ERO Enterprise consistent with the CMEP and the RoP. During the early stages of the ERO Enterprise (NERC and the Regions), broad flexibility was needed to meet the statutory start-up date of the ERO. But this swift implementation strategy came with a cost – varying business processes with varying tools (e.g., CRATS, CITS, and CDMS), creating both perceived and real consistency issues in the implementation of the CMEP. It also resulted in the inability to share information across the ERO Enterprise, and difficulty in documenting conformance with applicable professional standards and the RoP.

During the past 10 years, the Regional Entities and NERC matured, as have CMEP business processes and tools. At this stage of the ERO Enterprise development, it is prudent and necessary to evaluate and develop better-aligned business processes and tools by leveraging and blending the collective experiences of the Regional Entities and NERC. In addition, given the growth in compliance requirements across many industries, more commercial application options are available today as compared to just a few years ago.

The lack of a common technology platform contributes to inconsistent use of data labels and terminology, resulting in inefficiencies to reconcile data from disparate systems to accurately analyze reliability and compliance data and trends. This inconsistency is illustrated below by showing:

- Only limited interaction between the NERC framework and the Regional processes – specifically, at the interface between the CRATS system and the CITS and CDMS systems (illustrated by the green “Region-Defined Tools and Processes” and the blue “NERC-Defined Tools and Processes”).
- A smaller set of “rigid core” data used at the Regions consistent with the NERC use, limited to noncompliance and mitigation data (Illustrated by the blue “NERC Rigid Core Data”).
- Multiple processes or approaches to CMEP work, which results in real and perceived inconsistencies (illustrated by both the green “Regional Flexible Edge Data” and the green “Region-Defined Tools and Processes”).

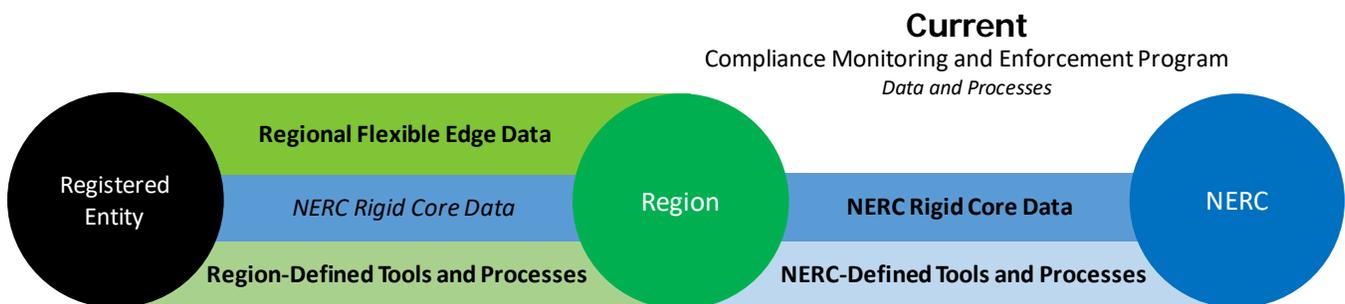


Figure 3

## Future State

In the proposed future state, the ERO Enterprise data and processes model is expanded to include more of the Regional processes (moving some of the green “Region-Defined Tools and Processes” and “Regional Flexible Edge Data” into the blue “Rigid Core”). In so doing, common processes, procedures and terminology can be adopted to better drive alignment and reduce real and perceived inconsistencies, while reducing costs across the ERO Enterprise. The future state proposes replacing the current CMEP tools from OATI and Guidance with one system used by NERC and the Regions. The cost for that replacement is included in the budget estimates.

To address Region-specific needs, it is expected that Regional Entities may need to continue to collect Region-specific data and/or use Region-defined tools and processes for unique analyses (represented by the remaining green areas). The future model allows for this flexibility (subject to ERO oversight), with an expectation that the general preference will be to use rigid core data, as well as ERO Enterprise defined tools and processes, where possible.

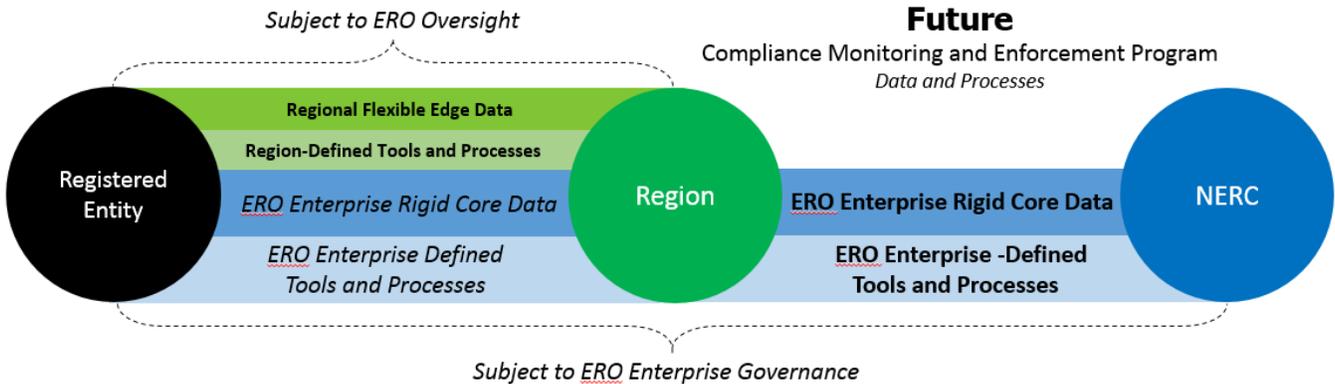


Figure 4

The solution approach shown below illustrates several interrelated functional components that will comprise the proposed ERO Enterprise CMEP system. The following diagram and discussion reviews the relationship between those components.

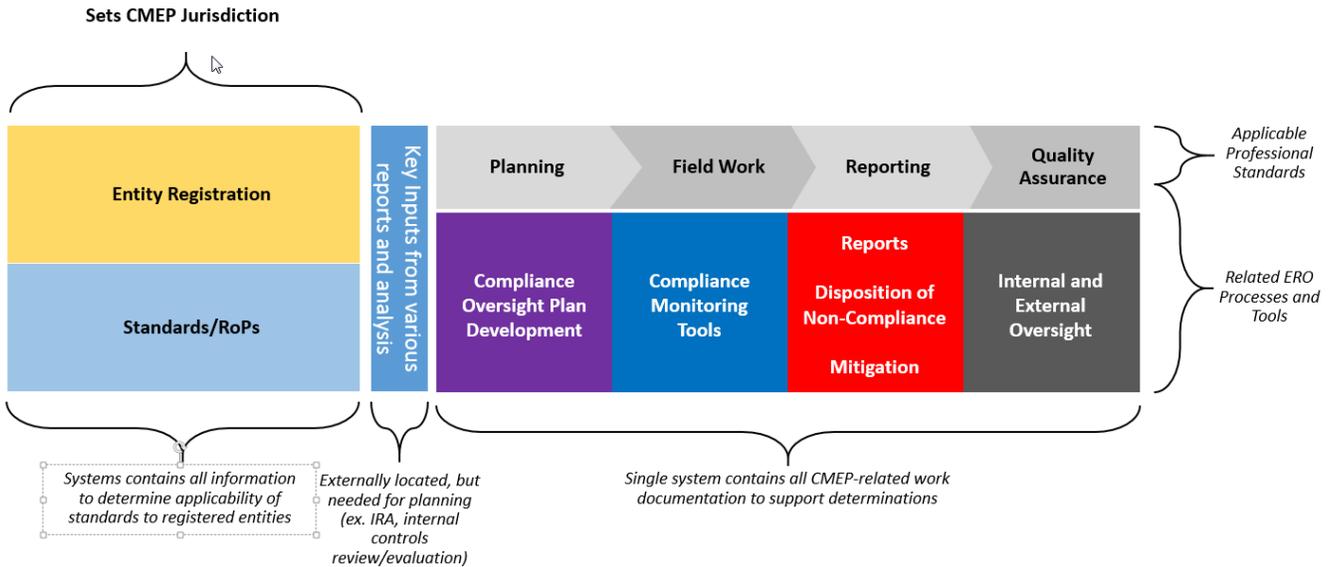


Figure 5

CMEP jurisdiction is established through an entity registration database, standards database, and the applicable RoP rules and any exceptions (i.e., exclusions from jurisdiction resulting from BES process). The jurisdiction elements form the foundation for the CMEP work and serve as the starting point for compliance oversight plan development, a key part of the proposed system. As illustrated, the overarching workflow matches normal practices found in authoritative assurance standards (e.g., the Government Accountability Office’s Generally Accepted Government Auditing Standards, or GAGAS, also known as the “Yellow Book”): planning, field work, reporting, and quality assurance.

Compliance oversight planning is a comprehensive endeavor and requires linkages from various reports and analysis, including inherent risk assessments, past compliance history, miscellaneous technical reports, periodic reporting of key information, events and other information. At this time, much of the information will serve as inputs into the compliance oversight plan development; but, if this information can be directly accessed through the proposed CMEP system, the specifications will be noted as such.

After the compliance oversight plan is developed (which includes the scope of the Standards and Requirements for monitoring and the monitoring tools themselves, e.g., audits, spot checks, self-certifications), the associated notifications, data request forms, etc., can be generated. In some instances, registered entities will require access to the system to submit completed data requests (e.g., “evidence”), self-certifications, etc. In addition, registered entities self-report, a key compliance monitoring activity. Self-reporting will also be included in this part of the system and will require registered entity access. While investigations are less frequent, this part of the system will also be used for documenting the planning and field work associated with investigations.

Reporting aspects of the proposed system will accommodate audit, spot reports, and dispositions of non-compliance (e.g., compliance exceptions, notices of penalty, settlements). In addition, there will be a separate mitigation process in the system to document and track mitigation of all non-compliance; this will require access by registered entities.

Lastly, the system will address oversight through quality assurance mechanisms. Quality assurance is both a Regional and NERC responsibility. Within this part of the system, both NERC and the Regions will have the ability to document their oversight activities on the CMEP work performed. The system should be designed in such a fashion that NERC can access internal Regional oversight activities to determine its level of external oversight. Quality assurance should be accessed only by NERC and the Regions.

Throughout the system development, careful consideration will be given to ensuring appropriate access controls and protections are in place to comply with rules around confidentiality of information and security of sensitive, critical infrastructure information.

## Business Value Analysis

NERC’s standard business value analysis process will be used to identify expected benefits and beneficiaries, how those benefits will manifest and be measured to ensure overall project success. NERC evaluates six distinct benefit areas as shown in the table below. In each area, an expected benefit has been proposed, as well as how that benefit could be measured.

**Table 2 – Benefits and Measurements**

Benefit Area	Benefit Summary	Measurement Approach
Reduce Reliability Risk	Improved visibility will enable the ERO Enterprise, registered entities, and industry, in general, to target emerging reliability risks more quickly.	Feature Delivery Confirmation
	Increased transparency will assist NERC in validating that reliability risks are managed and addressed in the compliance monitoring process (understanding what requirements were audited and complied with, as opposed to only seeing violations found and reported during the enforcement process. Help show how monitoring process choices relate back to the registered entity risk assessment).	Feature Delivery Confirmation

Table 2 – Benefits and Measurements

Benefit Area	Benefit Summary	Measurement Approach
Increase Capability	Ability to view an aggregate risk profile for a given Region, as well as look for trends and extend of condition across Regions.	Feature Delivery Confirmation
	Ability to view a risk profile that shows compliance history trends in various areas for each registered entity, as well as look for trends across registered entities.	Feature Delivery Confirmation
	Ability to view compliance history trends by standard or standard family.	Feature Delivery Confirmation
	Increased analytics and reporting capability.	Feature Delivery Confirmation
	Registered entities have a single system for managing and submitting supporting documentation.	Feature Delivery Confirmation
	Capability to share information between and among NERC and Regions within the tool.	Feature Delivery Confirmation
Reduce Corporate Risk	Consistent application of CMEP and RoP across the ERO Enterprise including fair and objective outcomes.	ERO Internal Audit Results
	Reduce new significant noncompliance findings in NERC’s implementation of the Regional Entity oversight plans or adherence to the RoP with regard to Compliance Monitoring and Enforcement.	ERO Internal Audit Results
Increase Work Quality	NERC and Regions report perceive increased quality in data and work products.	Annual Survey
	Registered entities report perceive increased quality and consistency in data and work products.	Annual Survey
	Registered entities report increased consistency in interactions with the Regions with regard to the CMEP.	Annual Survey
	Elimination of manual data exchange steps between modules (from planning to monitoring to enforcement, and from the registered entities to the Regions to NERC), reducing transcription errors.	Feature Delivery Confirmation
	Standardized data definitions within a single system will reduce errors.	Feature Delivery Confirmation
Increase Productivity	When asked, registered entities report increased productivity in their interactions with the CMEP process.	Annual Survey
	Reduced processing time of various steps with the CMEP.	(\$ ) Specific Metric (compared to historical averages)
	Increased automation of routine CMEP activities.	(\$ ) Feature Delivery confirmation (specific activities to be determined in the future).
	Regions and NERC will see reduced manual CMEP labor (implying resources are focused instead on risk-based CMEP analyses and activities).	(\$ ) Time Tracking: Total number of hours of manual CMEP Labor reported by ERO Enterprise staff

Table 2 – Benefits and Measurements

Benefit Area	Benefit Summary	Measurement Approach
		will trend down from 2018 to 2026 (Updated from 2018 to 2022)
	Regional risk, IRA, entity history and other supporting analyses used to create compliance oversight plans are easily accessible and analyzed.	(\$) Feature Delivery Confirmation
Reduce Cost	Reduction or elimination of costs associated with webCMDS, CITS, and CRATS before the end of 2022 (updated from 2021).	(\$) Year to year cost comparison.
	See financial analysis for more details.	

# Financial Analysis – Updated April 2020

The CMEP Technology Project will be implemented in phases. As each phase is launched, the detailed scope, budget, and resources for those phases will be defined and approved through the program governance structure.

The original financial analysis was based on NERC’s initial research, begun in late 2014 with Gartner, Inc., a recognized leader in information technology research and advisory services, using numbers based on the average costs from the responses to a Request for Information. The updated financial analysis below is based on the vendor selected and the actual costs to date for implementation.

## Estimated Capital Investment

**Table 3**

	2017 (Act)	2018 (Act)	2019 (Act)	2020 (Fcst)	2021 (Fcst)
<b>TOTAL CAPITAL COST BY YEAR</b>	\$280,000	\$1,473,850	\$1,837,100	\$1,807,000	\$1,800,000
<b>TOTAL CAPITAL INVESTMENT</b>	\$7,197,950				

## Estimated Annual Operating Costs

**Table 4**

	2017 (Act)	2018 (Act)	2019 (Act)	2020 (Fcst)	2021 (Fcst)
<b>TOTAL ANNUAL COSTS</b>	\$0	\$406,400	\$458,800	\$546,216	\$563,889

## Estimated Return on Investment (ROI)

The Assumption used in NERC’s standard ROI model were updated as follows:

- 1.) The model was updated to reflect actual investments to date for years 2017-2019.
- 2.) The model was updated to reflect current future investment forecasts for years 2020 and beyond.
- 3.) The model was updated to use staffing counts and salaries from the 2020 Business Plan and Budget documents, reflecting the dissolution of the SPP and FRCC Regional Entities.
- 4.) Elimination of fees paid for CITS, CDMS, and CRATS was delayed from 2021 to 2022.
- 5.) Overall labor savings were reduced by 33% across the board to more conservatively evaluate the benefits identified in the business case
- 6.) Additionally, based on the development of the Secure Evidence Locker, a further reevaluation of labor savings was undertaken to remove the benefits of exchanging and collaborating on certain entity evidence and documents within Align. Using labor data provided by the regions in 2018 and 2019 related to the areas of key benefit accrual identified for Align, three tasks are expected to be impacted:
  - a. Manually Preparing and Exchanging Data and Documents with Registered Entities (benefits assumed to reduce by 50% based on SEL)
  - b. Manually Preparing and Exchanging Data and Documents Internally with Other Departments or with Other Regions (benefits assumed to reduce by 25%, based on use of SEL and adoption of enhanced documentation processes)

- c. Manually Preparing and Exchanging Data and Documents with NERC (benefits assumed to reduce by 25%, based on use of SEL and adoption of enhanced documentation processes)

A summary of the labor analysis is shown below:

Work Areas Where Align is Expected to Benefit CMEP Activities	Labor Percent	Percent Locker Interactions	Locker Labor Percent
Manually Preparing and Exchanging Data and Documents with Registered Entities	12.0%	50%	6.0%
Manually Preparing and Exchanging Data and Documents Internally with Other Departments or with Other Regions	14.4%	25%	3.6%
Manually Preparing and Exchanging Data and Documents with NERC	16.3%	25%	4.1%
Manually Cleaning Data and Ensuring and Data Quality	3.5%		
Manually analyzing data	4.5%		
Manually Preparing and Processing Violations	46.7%		
Manually Tracking Dates and Schedules	2.6%		
<b>TOTALS</b>	<b>100%</b>		<b>13.7%</b>

Table 5 – Locker Labor Analysis

Based on this analysis, productivity increases used in the model were reduced throughout the model by an additional 13.7%. This resulted in the following overall changes to the productivity increase expectations, with a decrease from 7.00 % to 4.02%.

	Expected Increases in Productivity			
	Impacted FTEs	2021	2022	2023 and Beyond
Core Regional CMEP Staff	174	4.75%	6.90%	8.63%
Core NERC Enforcement Staff	7.5	3.56%	5.18%	6.47%
Core NERC Regional Entity Assurance and Oversight staff	5	3.56%	5.18%	6.47%
Core NERC Compliance Analysis, Registration, and Certification staff	3	2.37%	3.45%	4.32%
Remaining CMEP Staff	104	0.23%	0.35%	0.43%
Core RAPA, RASA, EA, PA Staff	45	0.71%	1.04%	1.29%
Remaining RAPA, RASA, EA, PA staff	58.3	0.24%	0.35%	0.43%
NERC Standards Information Staff	4	0.71%	1.04%	1.29%
Remaining Standards Staff	23.1	0.24%	0.35%	0.43%
<b>TOTAL Impacted ERO Enterprise Staff</b>	<b>423.9</b>	<b>2.21%</b>	<b>3.22%</b>	<b>4.02%</b>
<b>Average Productivity Increase</b>				

Table 6 – Productivity Benefits

In addition, the following standard assumptions continued to be used:

- Estimated costs are considered at 90 percent of base estimate, 100 percent of base estimate, and 130 percent of base estimate (for future costs only).
- Estimated benefits are considered at 50 percent of base estimate, 100 percent of base estimate, and 150 percent of base estimate.

ROI is positive in five of the nine considered scenarios over seven years, with eight of the nine scenarios positive in ten years. Break-even year is estimated as 2023 (after full functionality is delivered), and maximum break-even is 2026. A net reduction in annual CMEP tool-related expenditures begins in 2022.

Figure 6 illustrates the estimated annual cumulative costs and hard dollars saved based on the data shown in Tables 3 and 4, and estimated annual cumulative benefits in soft dollars to represent efficiencies gained as described in Table 6 above. The points where the lines intersect represent the estimated break-even points for the nine scenarios considered. This same information is shown in Table 10. Tables 7 through 9 have been updated to show the 5-year, 7-year, and 10-year estimated returns on investment based on this same data, assuming 2.5 percent annual increase in payroll expenses and a 4 percent discount rate.

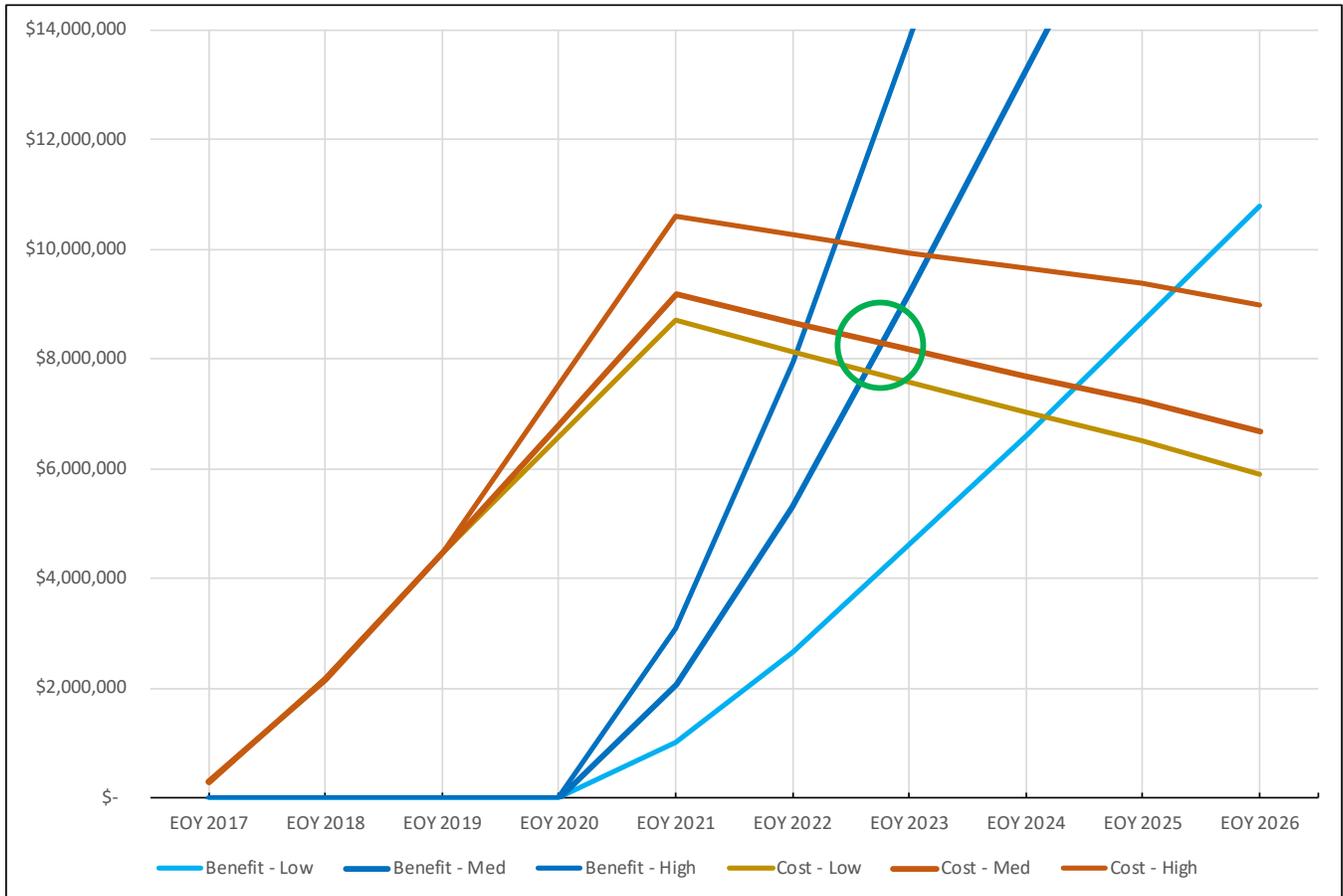


Figure 6 – Costs and Benefits Estimates Plots

5 Year PV	Benefit		
	Low	Medium	High
Low Cost	-\$7,037,015	-\$6,160,909	-\$5,284,804
Medium Cost	-\$7,448,237	-\$6,572,131	-\$5,696,026
High Cost	-\$8,681,903	-\$7,805,798	-\$6,929,692

7 Year PV	Benefit		
	Low	Medium	High
Low Cost	-\$3,241,519	\$516,030	\$4,273,580
Medium Cost	-\$3,748,189	\$9,360	\$3,766,910
High Cost	-\$5,268,200	-\$1,510,650	\$2,246,899

10 Year PV	Benefit		
	Low	Medium	High
Low Cost	\$2,483,900	\$10,750,090	\$19,016,281
Medium Cost	\$1,844,437	\$10,110,628	\$18,376,818
High Cost	-\$73,952	\$8,192,239	\$16,458,429

Break Even Year	Benefit		
	Low	Medium	High
Low Cost	2025	2023	2023
Medium Cost	2025	2023	2023
High Cost	2026	2024	2023

Tables 7 through 10 – ROI Scenarios and Break Even Year

As part of the benefits measurement process, many of the assumptions used within this analysis will be validated. See Table 2 for specific measurements, identified with a “\$.”

### Cost Capitalization – Accounting Treatment

The costs shown above only reflect the external expenses related to the project (e.g., consultants, hardware and software). Any project undertaken by NERC’s project management and information technology team also uses internal resources during various phases of the project, including requirements gathering, system development, and project management. However, as a normal practice, NERC does not include these internal labor costs in the business case analysis of projects. NERC does not currently anticipate any additional internal staffing needs to support the success of this project and plans to prioritize current internal resources appropriately.

While the internal labor costs are not included from an analysis and business case perspective, some of those costs will be capitalized as a part of the project cost according to prevailing accounting rules. In other words, the external costs ultimately spent on this project will be different than the costs reflected for accounting purposes over time, the latter being higher because of the capitalization of certain internal labor costs. This is common for projects that are primarily developed by external resources.

# CMEP Technology Project Governance – Updated April 2020

The CMEP Technology Project governance model is comprised of executive oversight, technical leadership, and program execution from both NERC and the Regions. The governance model includes the following groups and participants:

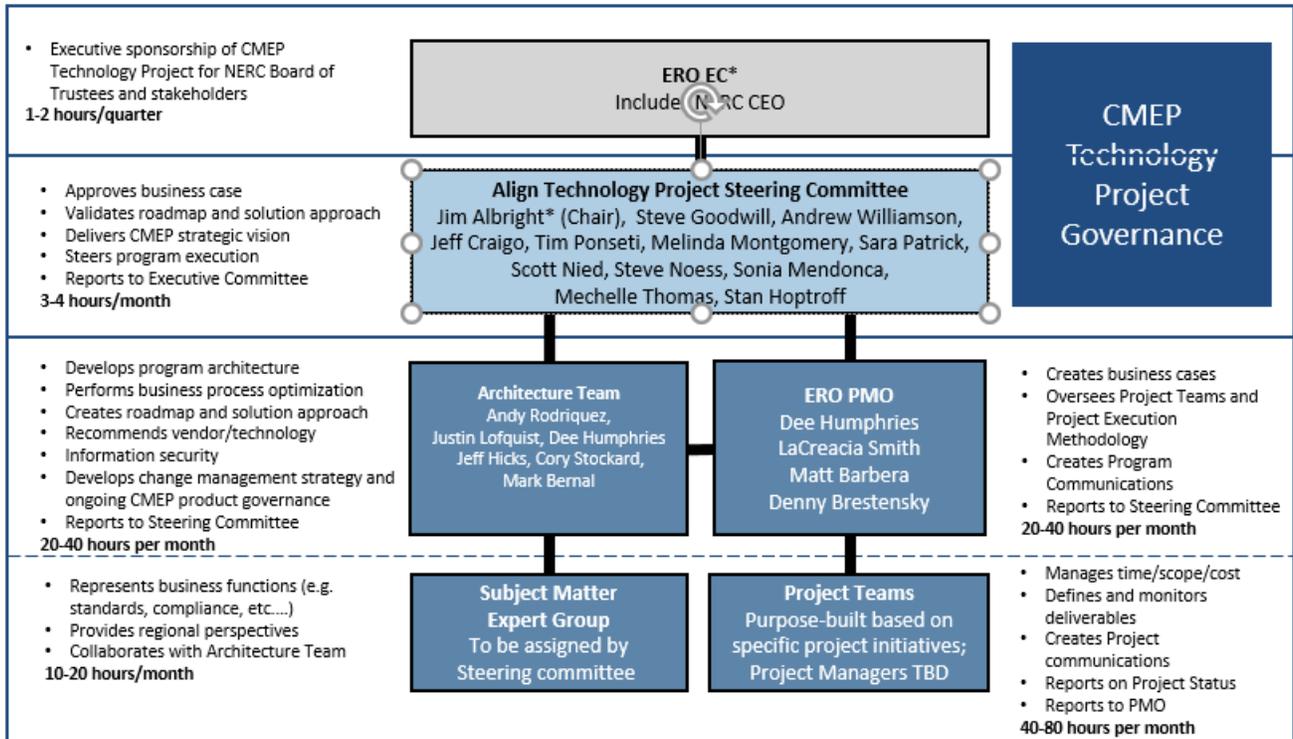


Figure 7 – Project Governance

The above groups will be responsible for overseeing program and project execution. To ensure long-term viability, business process and product governance should continue as the CMEP Technology Project evolves. The following diagram illustrates the proposed transformation from program to product governance.

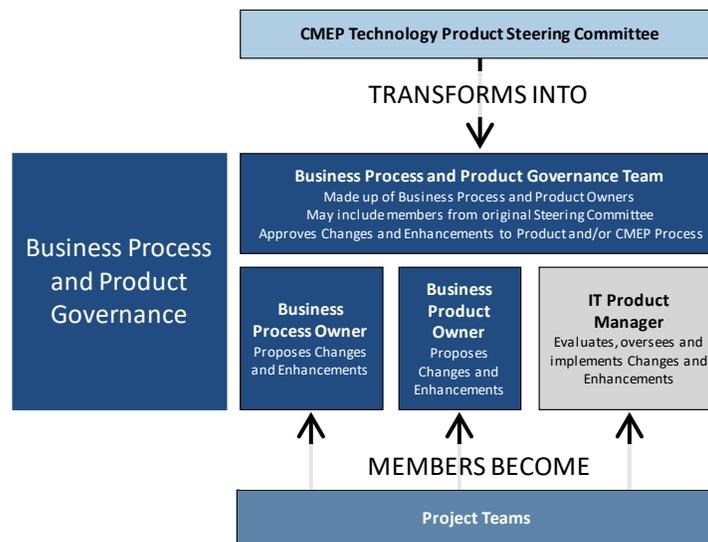


Figure 8 – Ongoing Governance

# CMEP Technology Project Execution

The ERO Project Management Office will oversee the execution of each project and the overall program, following standard procedures and best practices as defined by the Project Management Institute’s *Project Management Body of Knowledge*.

The PMO will provide project management standards in the following areas:

- Risk and Issues Management
- Scope Management
- Human Resource Management
- Contract Management
- Schedule Management
- Communications Management
- Change Control Management

The PMO also provides a rigorous tollgate approach to all initiatives. The tollgate schedule provides accountability in each phase of the project with all deliverables, time management, and budget oversight. At any point in the process, the executive sponsors decide if the project should continue. In addition, the PMO will provide NERC Finance with an overview of the project budget.

PMO Project Tollgate Schedule											
Tollgate		Tollgate 0	Tollgate 1	Tollgate 2	Tollgate 3- END-USER GO-LIVE	Tollgate 4					
Phase	Initiate		Plan/Analyze/Design		Develop/Test		Deploy		Warranty and Support		Close
Purpose	Business justification for project  Completion of business case and investment estimate approvals	Entrance Criteria: Approved Business Case and Inclusion on PMO Roadmap  Establish scope and resources assigned  High-level requirements and vendor selection  Architectural solution defined and designed  Business and technical processes are designed  Scope frozen for identified release	Systems are created and tested	Systems turned over to business for commercial use  Organizational changes implemented  Users are trained	Post-Go Live warranty and support activities  Transition to steady-state operations	Formal project close down  Resources released. Contracts closed. Final financials and reporting.					

Figure 9 – PMO Tollgates

# CMEP Technology Project Communications and Organizational Change Management

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A comprehensive change management plan will be developed and executed to facilitate adoption of the program and the business changes that will come with it.



## *Adoption Stages*

Figure 10

The ERO Project Management Office recognizes a four-stage model of organizational change management and user adoption:

- **Awareness.** Stakeholders understand that change is coming, but lack the details or impact to their role.
- **Understanding.** Stakeholders know why the change is happening, when it will affect them, and where it will take place.
- **Commitment.** Everyone knows how the change will affect them and has adopted the change.
- **Engagement.** Everyone is operating in the new environment and actively working to continuously improve the product.

Working with the various governance teams and the NERC communications team, the ERO Project Management Office will craft program and project communication strategies to ensure movement through these four stages is optimal.

# CMEP Technology Project Timeline – Updated April 2020

The timeline for the stages in the CMEP Technology Project will be governed by sponsorship priority, budget, and available resources. Specific dates will be governed by the ERO PMO and announced in subsequent charters.

Overall, the program approach will use the following phases:

- **2017:** Discovery → Plan → Analyze (Requirements) → RFP/Tool Selection
- **2018-2021:** Design → Develop and Test, and Incremental Delivery
- **Future:** BES and Facility data integration

The following conceptual planning roadmap illustrates the potential phases of the project. However, until a product is chosen and a more detailed planning effort is undertaken based on that technology, this schedule is conceptual only and will need to be refined as more is learned.

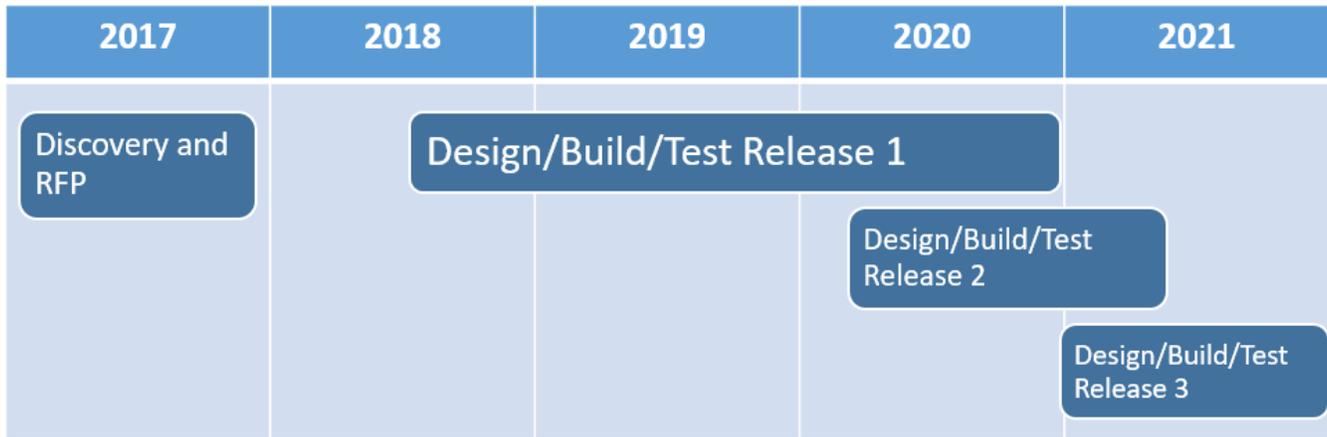


Figure 11

# CMEP Technology Project Background

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The CMEP Technology Project is one of four strategic vision and technology programs within the broader ERO Enterprise Systems Initiative. The scope of the CMEP Technology Project includes efforts to support a common ERO Enterprise-level CMEP system built from aligned business processes and integrated data sharing. As specific phases are launched, the detailed scope, budget, and resources for those phases will be defined and approved in subsequent charters.

NERC'S initial research began in late 2014 with Gartner, Inc., a recognized leader in information technology research and advisory services. As a Gartner client, NERC IT solicited their expertise and research capability for possible solutions. The recommendation was to evaluate a series of tools in the GRC platform arena. As platforms, they provided integrated sets of services that work together to meet business needs in these areas, rather than piecemeal solutions.

In reviewing this research, NERC discovered these platforms can potentially eliminate much of the manual work conducted across the ERO when executing the CMEP process. NERC then created a strategic roadmap to show how such a tool might be implemented at NERC and the Regions, and the potential benefits.

As part of the initial RFI mentioned earlier, an initial list of nine potential vendors was created, some from Gartner research, others from industry recommendations. Six of these vendors were identified on the Gartner Magic Quadrant; were excluded based on industry or on application specifics identified in Gartner reviews. The RFI was issued on September 25, 2015, with responses received November 13, 2015. The vendors/platforms invited to respond the RFI were:

- Certrec
- CMO Compliance
- Cooper Compliance
- EMC/RSA and the Archer platform
- MetricStream and their platform
- Morgan Kai
- Nasdaq and the B-Wise platform
- Resolver
- Thomson Reuters

Seven vendors responded; both CMO Compliance and Thomson Reuters elected not to respond. Upon receipt, NERC staff evaluated the responses based on vendor characteristics, solution features, and technology architecture. The four vendors identified for further consideration were EMC/RSA, MetricStream, NASDAQ, and Resolver. NERC asked these four vendors to set up demonstrations in the second quarter of 2016 for NERC and Regional Staff. Demonstrations were held in June for EMC/RSA Archer, MetricStream, and Nasdaq B-Wise. Resolver elected not to participate.

A brief introduction to GRC platforms was made with one of the vendors, MetricStream, and an initial demonstration was conducted in February of 2015. This provided clearer understanding of how a GRC system might work for the ERO Enterprise.

Following this, a detailed review of the RFI and its results was undertaken with Gartner on October 24, 2016, and then two sessions with NERC and Regional staff were undertaken on October 28, 2016. In these two sessions, Gartner provided an executive-level overview of the GRC space, then provided advice on the tool vendors under consideration. Gartner also reviewed our potential consulting partners (Deloitte and PricewaterhouseCoopers), including their placement within the Gartner Magic Quadrant for Risk Management Consulting Services.

NERC and the CMEP Steering Committee evaluated the potential consulting partners and ultimately selected Deloitte. The contract with Deloitte was executed on April 10, 2017, and initial work is beginning on this effort.

The next steps in this effort will be to conduct a formal Request for Proposal in Q4 2017 with the remaining vendors under consideration, and use a rigorous selection process to choose the platform best suited to meet the needs of the ERO Enterprise. The program team will solicit participation from the CMEP Steering Committee in the development of the RFP and the evaluation of the responses, and bring a final recommendation to the CMEP Executive Committee for review and approval.

## Reviews and Approvals

Stage Gate	Review Date	Status (Approved/Rejected)
<b>CMEP Steering Committee</b>	July 2017	Approved: Comments received and incorporated
<b>Technology Leadership Team</b>	July 2017	Reviewed
<b>SOTC Briefing</b>	August 2017	Reviewed
<b>BOTCC Executive Briefing</b>	August 2018	Reviewed
<b>FAC Briefing and 2018 budget review</b>	August 2017	Reviewed
<b>Q3 Board of Trustees Approval of 2018 Budget</b>	August 2017	Reviewed
<b>Q4 SOTC Review Final Business Case</b>	November 2017	Reviewed
<b>Q4 BOTCC Review Final Business Case</b>	November 2017	Reviewed
<b>Q4 FAC Review Final Business Case</b>	November 2017	Reviewed
<b>NERC Board of Trustees Approval</b>	November 2017	Approved
<b>Updated for Review</b>	April 2020	Reviewed