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December 3, 2021

The Honorable Ronald D. Kouchi,
   President, and
   Members of The Senate
Thirty-First State Legislature
Hawaii State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki,
   Speaker, and
   Members of The House of Representatives
Thirty-First State Legislature
Hawaii State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

Pursuant to HRS section 27-43.6, which requires the Chief Information Officer to submit applicable independent verification and validation (IV&V) reports to the Legislature within ten days of receiving the report, please find attached the IV&V report the Office of Enterprise Technology Services received for the Hawaii Public Utilities Commission's Content and Document Management System Project.

In accordance with HRS section 93-16, this report may be viewed electronically at http://ets.hawaii.gov (see "Reports").

Sincerely,

Douglas Murdock (Dec 9, 2021 10:26 HST)

DOUGLAS MURDOCK
Chief Information Officer
State of Hawai'i

Attachment (1)

Content and Document Management System (CDMS) Project

## Hawaii Public Utilities Commission (PUC)

IV&V Monthly Status Report
For Reporting Period: **Sept 2021**

Draft Submitted: 10/18/2021

Final Submitted: 10/28/2021

PUBLIC CONSULTING GROUP

Solutions that Matter

Overview

- Executive Summary

- IV&V Findings and Recommendations

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- IV&V Engagement Status

- Appendices
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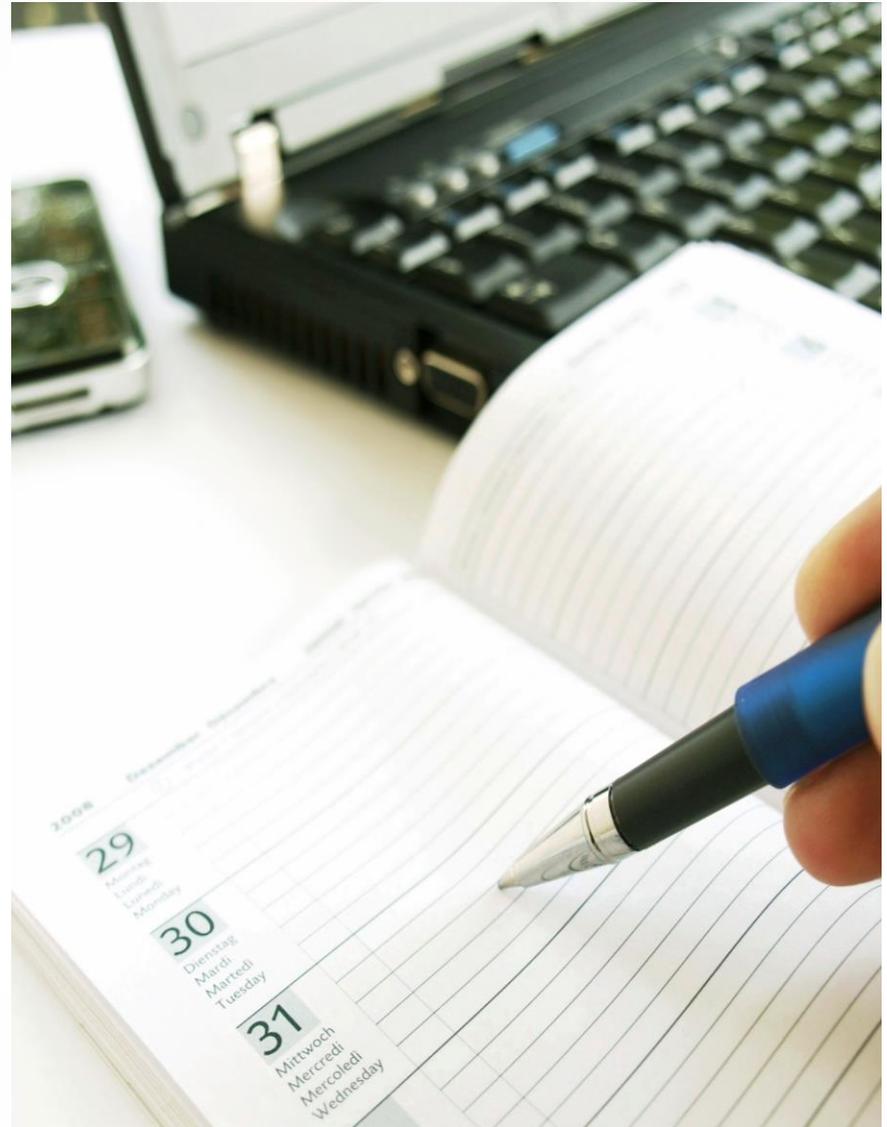
Executive Summary

For the September 2021 reporting period, the System Integrator is finishing the analysis phase and is almost complete with developing future state processes and user stories.

The main concerns going into the development phase are an aggressive project schedule, inefficient analysis activities and project documentation that lacks sufficient detail. These concerns coupled with planning around PUC resource constraints reduced PUC confidence that a system that fully meets its needs will be implemented on-time.

As examples, Deliverable Expectation Documents (DEDs) provided this reporting period did not initially adhere to contractual expectations and took much longer than anticipated to finalize. As slack time is little to none in the schedule and the project's ability to absorb change is minimal, PUC rushed through reviews and were concerned that something may have been missed.

Also, some of the workshops were not efficiently ran. This raised concerns about the usefulness and productivity of the workshops. IV&V provided recommendations to mitigate PUC resource constraints such as reviewing the sprint road map, developing fully resourced work plans and adopting more agile practices. IV&V will continue to monitor the schedule, analysis activities and project documentation for improvement.

Sept '21	Category	IV&V Summary
L	Project Management	PUC resource availability to support the CDMS project is limited. To mitigate those resource constraints, a road map was developed to help identify the appropriate timing for different SMEs and support resource planning throughout the project.

Executive Summary

IV&V is monitoring four findings. One is a risk and three are preliminary concerns. The one risk is rated low and is found in the project management category.

Findings by Type

Risks, 1, 25%

Concerns, 3, 75%

■ Risks ■ Issues ■ Concerns

Open IV&V Risks/Issues by Category and Priority

	0	1	2	3	4	5	6	7	8	9	10
Project Mgmt											
Requirements Mgmt											
Software Dev											
Developmet Env											
Testing											
Operating Env											
Data Mgmt											
Operations Mgmt											
Training											

■ Low ■ Medium ■ High
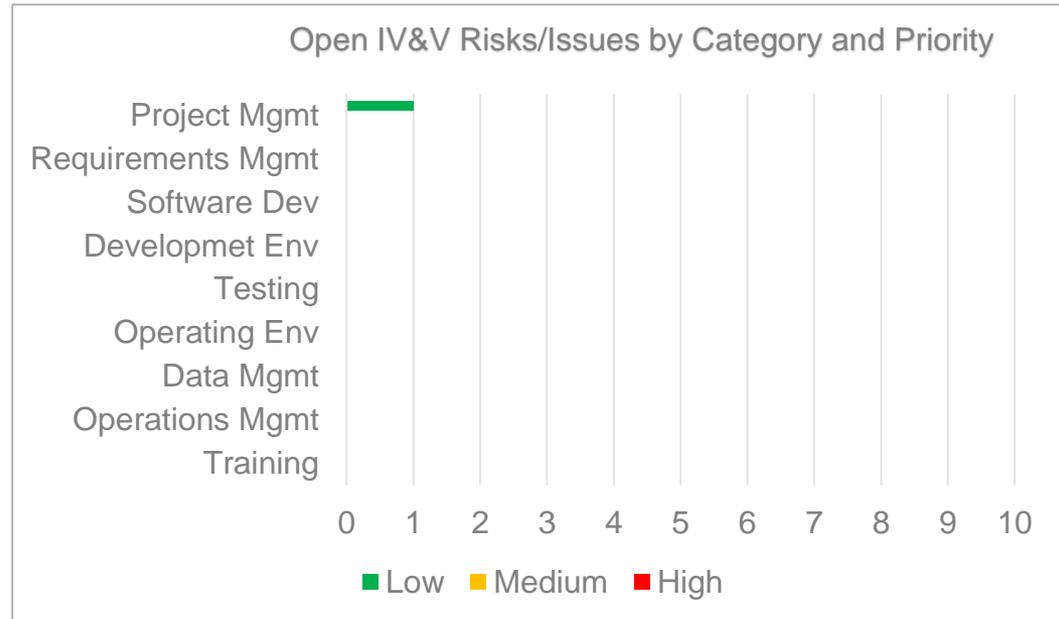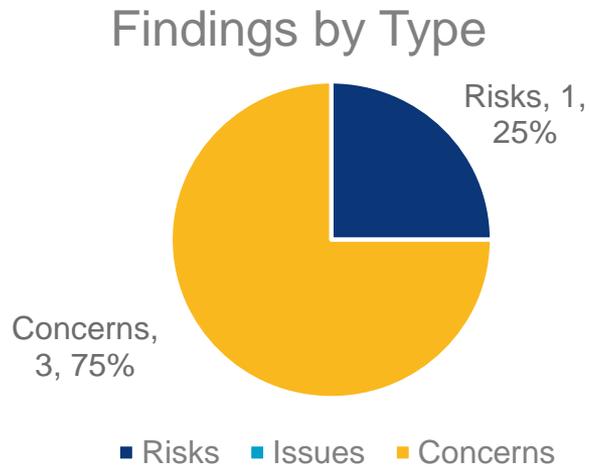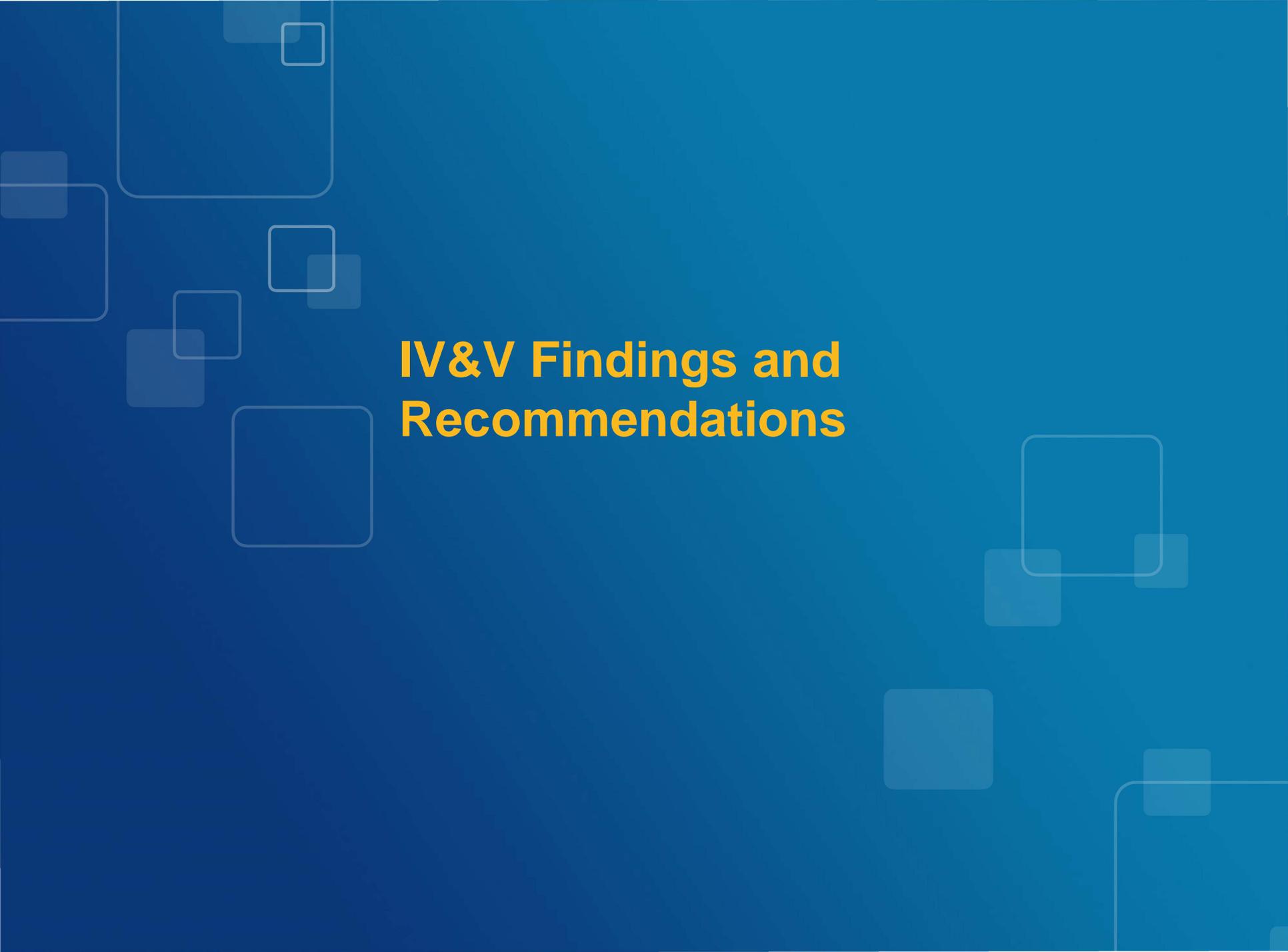
IV&V Findings and Recommendations

IV&V Findings and Recommendations - Risks

IV&V ID #14	Type: Risk Rating: Low	Status: New	Category: Project Management Date Opened: September 30, 2021

Title: Limited PUC resource availability could lead to schedule delays and incomplete system design.

Observation: Although the CDMS Project is a high priority at the PUC, resource limitations appear to exist throughout the life cycle of the project. These constraints were communicated to the System Integrator (SI) early in the project for planning purposes.

Context: System development projects require coordination and engagement between the SI and the client in order to accurately document business needs, processes, user stories, business rules, and anything needed to build a system that meets the client's needs.

Impact: Schedule delays, increased project cost, implementation of a solution that that does not meet the PUC's needs

Updates

September 30, 2021: IV&V consolidated findings related to PUC resources into a single finding to facilitate easier tracking, management and resolution of findings.

Over the past few months, there have been concerns with PUC resource availability in relation to their planned level of engagement throughout the project. The SI understands these constraints and is incorporating these constraints into their planning and approach moving forward.

For example, PUC involvement during the development sprints will be increased to include PUC feedback earlier in the process. Not only can this result in a better end product, but it may also reduce the demand on PUC resources later in the project during the User Acceptance Testing phase.

Additionally, a revised road map (i.e., Sprint Plan) was created to help identify specific resource requirements during each sprint. It did not identify specific SMEs, rather only identified sections.

IV&V Findings and Recommendations - Risks

IV&V ID #14 (cont.)	Type: Risk Rating: Low	Status: New	Category: Project Management Date Opened: September 30, 2021

Recommendations/Action Items	Period	Status
PUC PM and SI PM develop a plan to address these constraints. Work closely together throughout the project to plan important meetings based on resource availability.	Long Term	In progress
SI develop fully resourced work plan.	Short Term	Not started
PUC and SI review Sprint Plan and ceremonies to identify specific resources to help identify resource risk that can be addressed before sprint cycles begin.	Short Term	In progress
SI employ agile processes and methodologies so that progress can be made regardless of PUC resource availability.	Long Term	In progress

IV&V Findings and Recommendations - Risks

IV&V ID #12	Type: Risk	Status: Closed	Category: Requirements Management
	Rating: Low		Date Opened: August 2021

Title: **The 3.2 Conceptual Design deliverable will not be completed as per the original scope during the design phase, rather, some sections will be completed during the development sprints.**

Statement: The 3.2 Conceptual Design deliverable was to be completed by the end of September 2021 to coincide with the end of the analysis/design phase. While some sections will be completed, other sections will be completed after the development sprints. The time and effort required to complete the remaining 3.2 Conceptual Design sections will now be spread across the development sprints during the 4 planned 2-hour backlog refinement meetings in each sprint. If these refinement meetings do not provide sufficient time to elicit the information needed from PUC staff, the design may not meet the needs of PUC and/or cause schedule delays.

Supporting Analysis: The original schedule showed 3.2 Conceptual Design as being delivered after the analysis/design phase. IV&V inquired about whether or not the content of that deliverable is typically developed this early and the SI confirmed it was not. Therefore, time/effort during the analysis phase that PUC resources were involved with to complete the 3.2 sections will now also be required during the development phase.

Updates

- September 2021: This finding was closed.

Recommendations/Action Items	Period	Status
• Review sprint plan and ceremonies to identify any risk that can be addressed before sprint cycles begin	Short Term	In progress
• Monitor sprint velocity and burndown rates closely during sprint cycles to identify potential risks and issues with project progress	Long Term	Not started

IV&V Findings and Recommendations - Risks

IV&V ID # 9	Type: Risk	Status: Closed	Category: Requirements Management
	Rating: Low		Date Opened: July 2021

Title: **Requirements Workshop notes are sent at the end of the two weeks of workshops, and not sooner**

Statement: Best practices suggest distributing meeting notes within a day or two of the meeting to obtain feedback from attendees. By waiting two weeks the attendees' ability to provide accurate feedback may decrease, resulting in possibly inaccurate business and technical requirements.

Supporting Analysis: The system integrator was not providing notes after the workshops. After an initial inquiry, it was confirmed notes were not going to be provided for each workshop session.

Updates

- September 2021: This finding was closed.
- August 2021:The SI did not provide a summary of notes after the two weeks of initial workshops as expected. However, the outcomes of all the workshops will be documented in the deliverables, mainly 3.1 Requirements Traceability and Project Scope which will contain all requirements and process flows During the workshops, the SI has been reviewing "parking lot" items to make sure outstanding items documented during the workshops are confirmed.

Recommendations/Action Items	Period	Status
• Provide PUC sufficient time to review artifacts and the deliverables that result from all the workshops and meetings that occurred during the analysis/design phase.	Short Term	Pending
• Compile/distribute notes in an organized manner to enable PUC staff to review effectively and efficiently as staff availability is limited.	Short Term	Not applicable
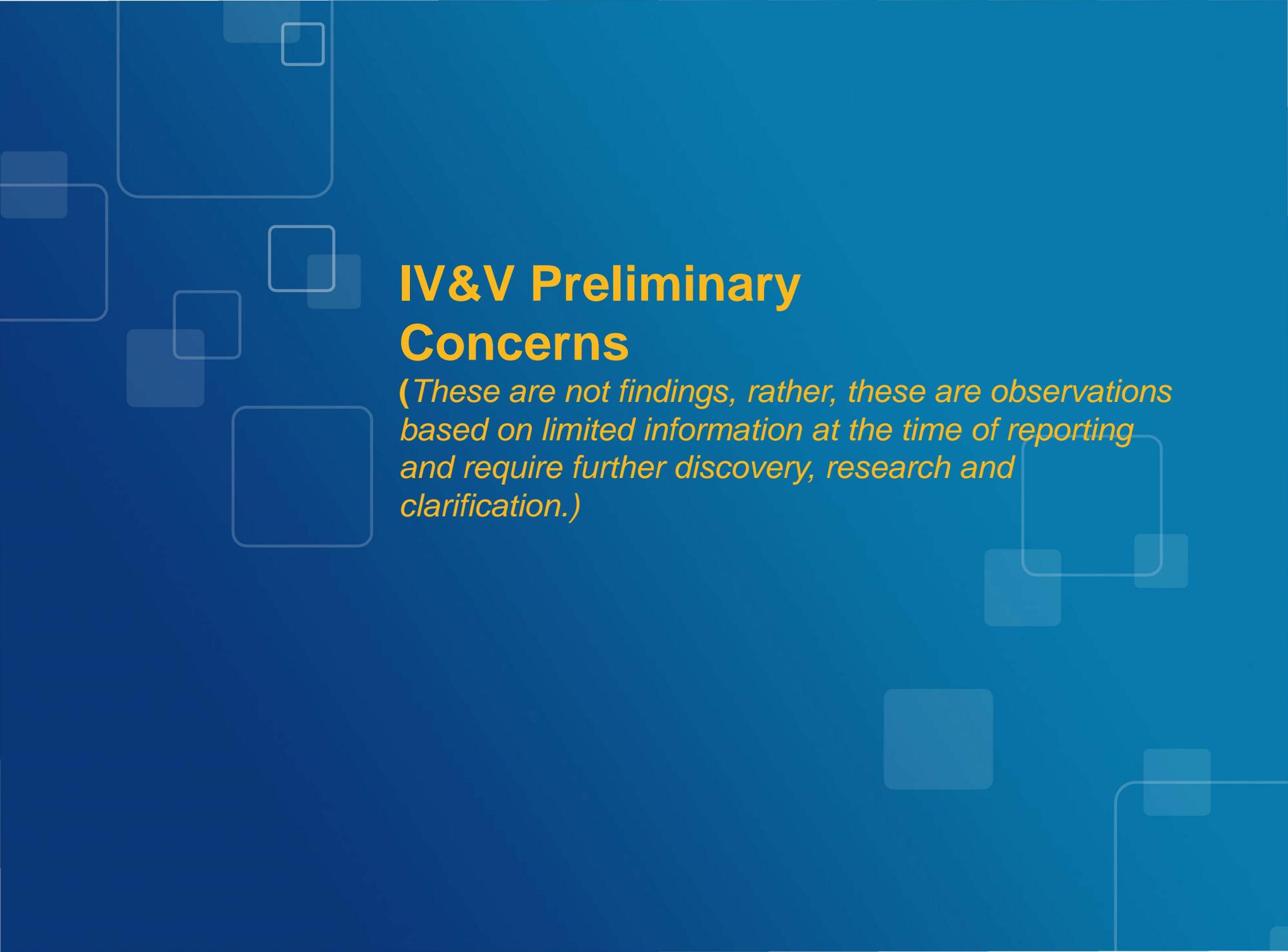
IV&V Preliminary Concerns

(*These are not findings, rather, these are observations based on limited information at the time of reporting and require further discovery, research and clarification.)*

IV&V Preliminary Concerns

ID #15	Type: Preliminary Concern Rating: n/a	Status: New	Category: Project Management Date Opened: September 30, 2021

Title: Project deliverables and artifacts that lack sufficient detail could lead to project delays, misunderstandings, inefficient project execution, and rework.

Observation: Early SI submissions of project deliverables lacked sufficient detail.

Context: Project planning documentation such as a project plan, risk management plan, communication plan and change management plan, can be effective tools for project this size to increase stakeholder understanding of the goals, approach, steps, timelines, roles and responsibilities. Additionally, conceptual designs, requirements traceability matrices, and process maps can also provide important information for successfully developing a system that meets PUCs needs.

Impact: Failure to provide sufficient details in project deliverables can lead to project team confusion, missteps, project delays, misunderstandings, inefficient project execution, and rework.

Updates

September 30, 2021: IV&V consolidated different findings related to project deliverables and documents into a single finding to facilitate easier tracking, management and resolution of findings.

PUC, IV&V and PUC's Contract Compliance Consultant had concerns with the draft deliverables and artifacts developed on the project. The deliverables and artifacts did not meet contractual requirements, were not understandable or were missing information. This caused longer than expected review periods and general confusion about project processes and methods.

Although these initial project deliverables and artifacts have been approved, PUC stated there was pressure to rush through the review process to prevent project delays.

IV&V Preliminary Concerns

ID #16	Type: Preliminary Concern	Status: New	Category: Project Management
	Rating: n/a		Date Opened: September 30, 2021

Title: Adoption of an aggressive schedule can lead to poor system design, PUC stakeholder frustration, and stretch PUC resources beyond their capacity.

Observation: The project has an aggressive schedule with little slack given the volume of deliverables and artifacts, the availability of PUC resources, and the perceived cadence of project meetings and workshops.

Context: A schedule with flexibility and sufficient slack to accommodate project changes that impact the schedule such as resource availability, activities that take longer than anticipated, or missed dependencies, typically result in a project that is delivered on-time. Projects with aggressive schedules tend to rush project activities to meet deadlines.

Impact: Rushed project activities lowers document and system quality. This causes customer frustration when the project appears rushed and activities do not seem thorough. A rushed schedule places unnecessary demand on PUC resources, especially if PUC resources are already fully utilized.

Updates

September 30, 2021: IV&V broadened the preliminary concern related to the aggressive analysis phase schedule to include the entire project schedule to facilitate easier tracking, management and resolution of findings related to the aggressive schedule.

The schedule for the analysis and requirements phase was planned for two months and was reportedly extended by two weeks due to the SI not having access to DocuSign earlier. To have zero impact to the project go-live date, the SI proposed to reduce the System Testing and UAT phases a week each where the SI felt there was some flexibility to reduce the timelines for those phases. It is unknown whether the current schedule can accommodate future schedule impacts without changing the go-live date.

IV&V Preliminary Concerns

ID #17	Type: Preliminary Concern Rating: n/a	Status: New	Category: Requirements Management Date Opened: September 30, 2021

Title: Inefficient business analysis activities could lead to rework, schedule delays, SME frustration, and poor system design

Observation: PUC and IV&V were concerned that many analysis outputs lacked sufficient quality and comprehensiveness. For example: 1) Feedback from PUC workshop attendees mentioned various workshops and meetings were not very useful, unorganized and unproductive. 2) The workshop cadence seemed slow and did not appear to achieve all intended goals of each workshop session. 3) Although not a contractual requirement, meeting notes from the workshops were not sent to meeting attendees which helps confirm the SI's understanding and shows visibility that the SI understands PUC's needs. 4) Although not explicitly required, PUC requested the SI to review the business documentation provided by a 3rd party prior to conducting the as-is workshops to save time and not start from a blank slate. Despite having access to and reviewing the existing business documentation, PUC observed many questions and time spent on areas that were already documented and PUC was not confident as to how much of the existing documentation was leveraged.

Context: Efficient business analysis processes promote effective communication, results in efficient meetings, provides clarity to complex topics, results in good project documentation and overall fosters client trust.

Impact: Inefficient analysis activities can have varying negative impacts to the project. For example: 1) Project delays can occur if meetings do not meet intended goals and require additional meetings and time. 2) Rework and redesign can happen if accurate information was not solicited because participants were not sure of their expectations during the meeting. 3) If client frustration happens, client buy-in and acceptance of the new system can be reduced resulting in a lower quality product

Updates

September 30, 2021: IV&V consolidated different concerns related to business analysis activities into a single finding to facilitate easier tracking, management and resolution of findings.

PUC provided feedback to the SI regarding their dissatisfaction of project analysis activities. The SI received this feedback and is taking it into consideration and are updating their project analysis activities to improve PUC satisfaction.

IV&V Preliminary Concerns

# 13	Type: Preliminary Concern Rating: n/a	Status: Closed	Category: Requirements Management Date Opened: Aug 2021

Title: The Gartner effort and deliverables that occurred prior to the CDMS project may not be fully leveraged in that any PUC needs or desires that were not documented as a requirement are not being tracked or traced in the current project.

Statement: PUC conducted in-depth reviews with Gartner prior to the CDMS project starting. During that effort, Gartner elicited a wide array of PUC requirements, pain points, future state maps, and overall needs. Given there is no contractual activity to leverage those materials other than the requirements, it is possible that the new system may miss previously identified PUC needs resulting in a system that does not meet all of PUC needs.

Updates

- September 2021: This finding was closed.

IV&V Preliminary Concerns

# 3	Type: Preliminary Concern Rating: n/a	Status: Closed	Category: Test Management Date Opened: July 2021

Title: Limited involvement of knowledgeable PUC SMEs during development sprints

Statement: The schedule shows UAT occurring after all the development sprints with demos occurring iteratively at the end of each sprint. If the demos are not very robust, the risk here is that PUC resources who know what the system should do may not be able to provide early feedback resulting in rework and/or a system that does not fully meet the needs of PUC. Making system changes later in the project is less cost effective, and less efficient than making them earlier in the project.

Updates

- September 2021: This finding was closed.
- August 2021: The PUC Technical SME will have access to the test environment during the sprint cycles but this is not formalized and still being defined. Also, although PUC staff will be involved during backlog grooming sessions, the sprint demos appear to be only an hour for PUC staff to review what was developed. Involvement still seems minimal from a group-perspective and IVV will continue to research and get clarification from the project team.

IV&V Preliminary Concerns

# 4	Type: Preliminary Concern	Status: Closed	Category: Project Management
	Rating: n/a		Date Opened: July 2021

Title: The draft Integrated Change Management Plan has limited information

Statement: Integrated change management is "the process of reviewing all change requests; approving changes and managing changes to deliverables, project documents, and the project management plan; and communicating the decisions." IV&V was unable to assess the Plan's completeness because the draft lacked details such as: An end-to-end process for approving or denying change requests; criteria by which a change will be examined, including impact analysis on schedule, scope, budget, quality and other factors pertinent to the success of the project and solution; stakeholder communication/decision making information (who makes the decisions and how are decisions communicated); information about the change control board or governance; and how are changes tracked.

Updates

- September 2021: This finding was closed.
- August 2021: An updated Integrated Change Management Plan was developed. IVV will review and conduct interviews for clarification as needed.

IV&V Preliminary Concerns

# 6	Type: Preliminary Concern Rating: n/a	Status: Closed	Category: Project Management Date Opened: July 2021

Title: Two months to complete the analysis/design phase seems very aggressive

Statement: After reviewing the number of required deliverables **and** observing workshop meetings during the week of 7/26/2021, two months seem very aggressive. If the two months is underestimated, coupled with the availability of PUC resources, this may result in extending the analysis phase, thereby delaying development, or deliverables that do not fully meet the needs of PUC which could be rejected, also causing schedule delays.

Updates

- September 2021: This finding was closed
- August 2021: The 3.2 Conceptual Design is no longer going to be completed by the end of the analysis/design phase therefore the total amount of work to be completed is less. Regarding the as-is and future-state processes and requirements, the SI has stated they are on track and do not need to engage PUC in large format meetings to complete the analysis phase.

IV&V Preliminary Concerns

# 7	Type: Preliminary Concern	Status: Closed	Category: Project Management
	Rating: n/a		Date Opened: July 2021

Title: The Risk Management Plan has limited information

Statement: The submitted draft of the Risk Management Plan does not answer questions such as: What are the tools and processes for impact analysis? How will prioritization occur? How will risks be communicated outside of the regular Thursday meetings? At what point will escalation occur?

Updates

- September 2021: This finding was closed.
- August 2021: An updated Risk Management Plan was developed. IVV will review and conduct interviews for clarification as needed.
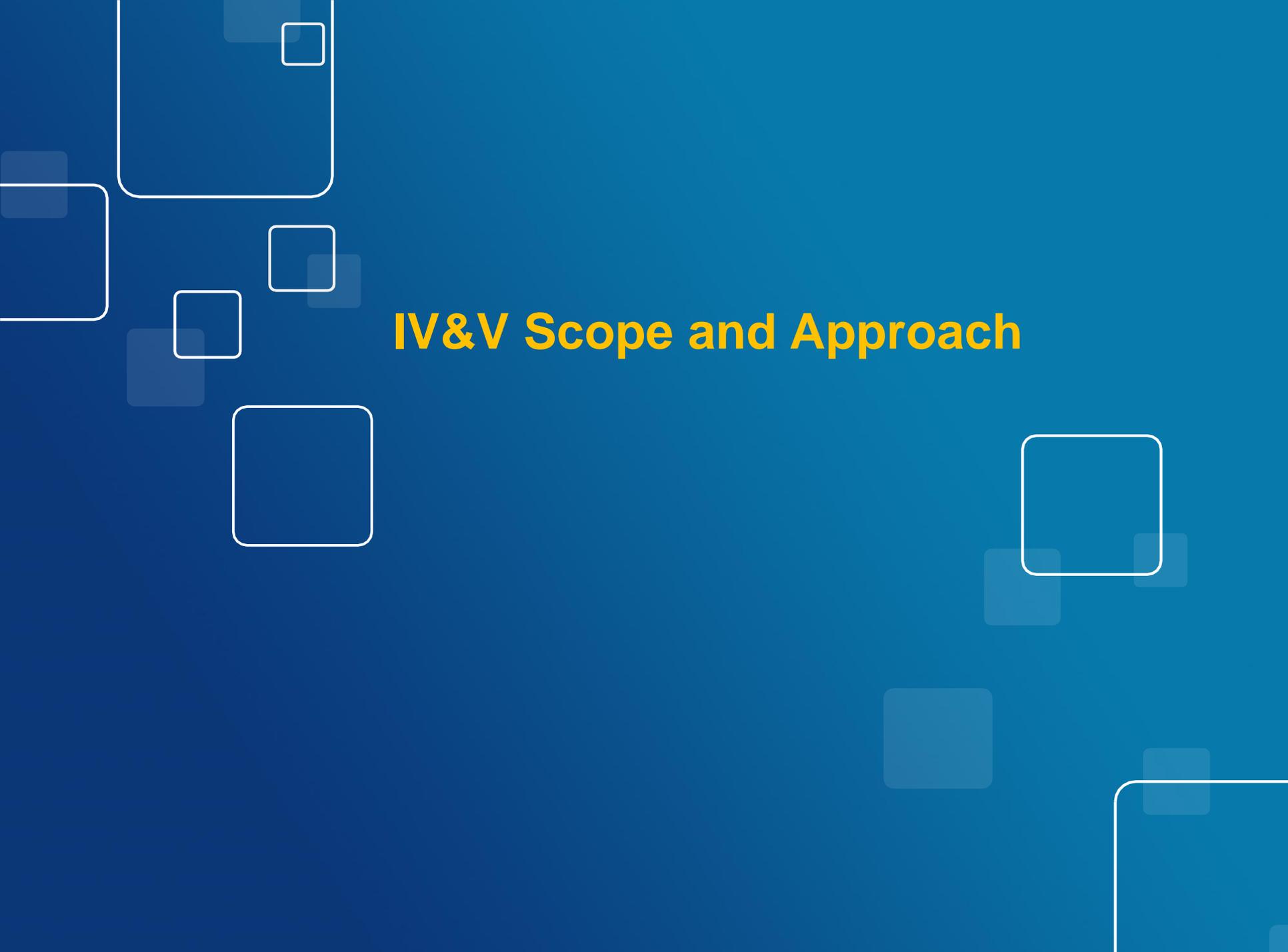
IV&V Scope and Approach

IV&V Scope

- In accordance with PCG's contract for the CDMS Project at the PUC, the subject areas that are within the scope of IV&V activities include:

  - Project Management
  - Requirements Management
  - Software Development
  - Development Environment
  - System and Acceptance Testing

  - Operating Environment
  - Data Management
  - Operations Oversight
  - Training

- As the CDMS IV&V project progresses, PCG's activities will focus on areas that represent highest risk to the Hawaii PUC.

IV&V Approach and Methodology

- What is Independent Verification and Validation (IV&V)?

  - Oversight by an independent third party that assesses the project against industry standards to provide an unbiased view to stakeholders

  - The goal of IV&V is to help the State get the solution they want based on requirements and have it built according to best practices

  - IV&V helps improve design visibility and traceability and identifies (potential) problems early

  - IV&V objectively identifies risks and communicates to project leadership for risk management

- PCG IV&V Methodology

  - Consists of a 4-part process made up of the following areas:

    1. **Discovery** – Discovery consists of reviewing documentation, work products and deliverables, interviewing project team members, and determining applicable standards, best practices and tools

    2. **Research and Analysis** – Research and analysis is conducted in order to form an objective opinion.

    3. **Clarification** – Clarification from project team members is sought to ensure agreement and concurrence of facts between the State, the Vendor, and PCG.

    4. **Delivery of Findings** – Findings, observations, and risk assessments are documented in this monthly report and the accompanying Findings and Recommendations log. These documents are then shared with project leadership on both the State and Vendor side for them to consider and take appropriate action on.

  Note: This report is a point-in-time document with findings accurate as of the last day in the reporting period.

IV&V Engagement Status

IV&V Engagement Status

IV&V Engagement Area	July	Aug	Sept	Comments
IV&V Budget	🟢	🟢	🟢	The IV&V engagement is deliverables-based and PUC is not at risk of being over budget
IV&V Schedule	🟢	🟢	🟢	The IV&V engagement aligns with the SI schedule. At this time,
IV&V Deliverables	🟢	🟢	🟢	There are no known risks to upcoming IV&V deliverables
IV&V Staffing	🟢	🟢	🟢	The IV&V team maintains the same team as proposed and there are no foreseeable changes
IV&V Scope	🟢	🟢	🟢	The IV&V project continues to operate within the scope of its engagement

Engagement Status Legend		
🟢 The engagement area is within acceptable parameters.	🟡 The engagement area is somewhat outside acceptable parameters.	🔴 The engagement area poses a significant risk to the IV&V project quality and requires immediate attention.

Appendices

Appendix A – IV&V Criticality Ratings

See definitions of Criticality Ratings below:

Criticality Rating	Definition
H	A high rating is assigned if there is a possibility of substantial impact to product quality, scope, cost, or schedule. A major disruption is likely and the consequences would be unacceptable. A different approach is required. Mitigation strategies should be evaluated and acted upon immediately.
M	A medium rating is assigned if there is a possibility of moderate impact to product quality, scope, cost, or schedule. Some disruption is likely and a different approach may be required. Mitigation strategies should be evaluated and implemented as soon as feasible.
L	A low rating is assigned if there is a possibility of slight impact to product quality, scope, cost, or schedule. Minimal disruption is likely and some oversight is most likely needed to ensure that the risk remains low. Mitigation strategies should be considered for implementation when possible.

Appendix B – IV&V Inputs

Meetings attended during the reporting period:	Artifacts reviewed during the reporting period:
9/9 – Project Schedule Meeting	PM 1.0 PMP – Draft
9/10 – DED Reviews	PM 1.2 Deliverable Expectation Document Deliverable
9/14 – DED Follow-ups	2.0 DED – Stakeholder Outreach and Communication Plan
9/15 – DED Updates	3.1 DED – Requirements Traceability Matrix & Project Scope Acceptance
Standing: Bi-weekly risk meetings	3.2 DED – Conceptual Architecture & Solution Design Documentation
Standing: Weekly IVV check-in meetings	3.4 DED – Solution Implementation
Standing: Weekly project status meetings	3.4 DED – Conversion & Migration
Standing: Daily standups as needed	4.7 DED – Cutover Plan
	4.8 DED – M&O Plan
	5.1 DED – Test Plan & Schedule
	6.1 DED – Training Plan
	6.2 DED – Training Curriculum & Materials
	7.1 DED – As Built Documentation
	7.4 DED – Project Close Out

Appendix C – Upcoming IV&V Activities

Anticipated meetings to attend next period	Anticipated artifacts to review next period
Deliverable Walkthroughs	3.1 Requirements Traceability Matrix & Project Scope Acceptance
Standing: Bi-weekly risk meetings	3.2 Conceptual Architecture & Solution Design Documentation
Standing: Weekly IVV check-in meetings	3.3 Solution Implementation Plan
Standing: Weekly project status meetings	Road Map/Sprint Plan
Standing: Daily standups as needed	Sprint 1 User Stories

Appendix D – Recommendation Periods

Period	Definition
Short Term	These are recommendations that should be completed within the month and/or require less than a month to complete
Medium Term	These are recommendations that should be completed within 2-6 months and/or require 2-6 months to complete
Long Term	These are recommendations that should be completed within 6 months to a year and/or require > 6 months to complete.