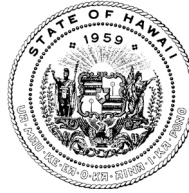


JOSH GREEN, M.D.  
GOVERNOR



DEPT. COMM. NO. 132  
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CHIEF INFORMATION  
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April 28, 2023

The Honorable Ronald D. Kouchi  
President of the Senate  
and Members of the Senate  
Thirty-Second State Legislature  
State Capitol, Room 409  
Honolulu, Hawai'i 96813


The Honorable Scott K. Saiki  
Speaker and Members of the  
House of Representatives  
Thirty-Second State Legislature  
State Capitol, Room 431  
Honolulu, Hawai'i 96813

Aloha Senate 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 report the Office of Enterprise Technology Services received for the State of Hawai'i, Public Utilities Commission (PUC), 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 (Apr 28, 2023 10:07 HST)

Douglas Murdock  
Chief Information Officer  
State of Hawai'i

Attachment



# Content and Document Management System (CDMS) Project

Hawaii Public Utilities Commission (PUC)

IV&V Monthly Status Report - FINAL  
For Reporting Period: **March 2023**

*Draft Submitted: 4/10/2023*

*Final Submitted: 4/26/2023*

# Overview

- Executive Summary
- IV&V Findings and Recommendations
- IV&V Preliminary Concerns
- IV&V Scope and Approach
- IV&V Engagement Status
- Appendices
  - A – IV&V Criticality Ratings
  - B – IV&V Inputs
  - C – Upcoming IV&V Activities



# Executive Summary

Public Utilities Commission (PUC) users are invested in the system to a greater extent as they conduct User Acceptance Testing (UAT) and get more exposure to system functionality. Users are providing higher quality/more feedback during these sessions than in previous sessions. The Project made progress addressing feedback from UAT Cycle 1 and began UAT Cycle 2 on March 13, 2023. However, Cycle 2 was delayed by almost a week so that test scripts could be updated to reflect Cycle 1 system revisions. This may delay training which is planned for April 17 as well as the current go-live date of May 15, 2023.

UAT was scheduled to complete on March 31, 2023, however, PUC users logged over 700 issues. Many issues were due to bad test scripts, but PUC stated many could be due to insufficient SI System Testing prior to UAT, as well as insufficient regression testing after defects were fixed. The SI has yet to provide an updated, fully traceable Requirements Traceability Matrix (RTM) that traces individual requirements to passed test cases, therefore it remains unclear if all requirements have been met and fully tested. UAT completion was also delayed due to delays in the completion of some functionality including payment processing. The Project has yet to determine the schedule impacts of these delays.

As the Project nears go-live, Organizational Change Management (OCM) efforts continue but are impacted by the availability of the PUC PM as the PUC PM has been focused on UAT. IV&V has raised this preliminary concern to a risk.


Further delaying go-live past May 15 would not introduce any significant business risk to the PUC, however, the SI stated training resource constraints may arise if the training schedule changes. Despite the risk of training resource availability, IV&V recommends the Project consider implementing another pause to further clean up the system and to catch up on OCM activities





# Executive Summary

Mar '23	Category	IV&V Summary
L		PUC SMEs and staff were available for Cycle 2 of UAT. Some SME activities fell behind, however, which led to the Project assigning other SMEs and the Business Analyst to assist.
L		The SI improved their deliverable quality in some instances. For example, PUC stated the 6.1 Training Plan was well developed. However, the 5.1 and 5.2 Testing deliverables were lacking in sufficient detail and did not meet PUC's expectation.
M	Project Management	PUC continues to struggle to complete all testing activities on schedule and are unable to thoroughly test and retest defects. Consequently, PUC requested to delay training to allow for more time for testing, however, the SI is urging PUC to keep the schedule as their training resources will not be available at a later date. The aggressive schedule was escalated to a Project issue from a risk and the Project may consider delaying go-live without delaying training
L		The PUC Project Manager and Technical SME are busy and report being "stretched thin" during UAT. However, the Business Analyst has helped alleviate the demand on the core team. The PM and the Technical SME do not foresee future challenges as the majority of UAT activities are complete
M		The development of payment processing functionality was still in progress and was not completed during UAT as scheduled. The Fiscal team is concerned as they were unable to test and verify the system is working as expected. The Project anticipates testing this functionality early April.

# Executive Summary

Mar '23	Category	IV&V Summary
 	Software Development	During UAT, PUC reported over 700 issues and the SI continues discovery and grooming activities. These issues are resulting in project delays, rework and redesign, and reduced client satisfaction.
		PUC continues to observe areas where business processes could have improved . However, PUC decided defer implementing improvements with the intention of identifying and addressing improvements after go-live.

Mar '23	Category	IV&V Summary
	Data Management	The Project originally estimated approximately 6000 duplicate account records that would need manual merging. However, the SI improved their pre-go-live automated cleansing and now estimate about 1600 duplicate records will need merging, which will result in less than 800 unique records. The Project anticipates cleaning up these records during the weekend before go-live based on resource availability.

Mar '23	Category	IV&V Summary
	Testing	The SI may not provide a fully traceable RTM that traces System Test and UAT test case results back to individual requirements. Without an RTM, it remains unclear how the Project will determine if System Test and UAT were successful. Cycle 2 of UAT was delayed because test scripts were not updated as a result of Cycle 1 changes and system go-live was pushed to 5/15/2023. Many of the defects reported during Cycle 2 were UAT test script defects. Other possible reasons for the high number of defects include the lack of sufficient system testing prior to UAT and the lack of regression testing when system fixes are applied. This lack of quality control increased the workload for the PUC project team members whose capacity is already constrained. IV&V elevated this issue priority to 'High' given these impacts.

# Executive Summary

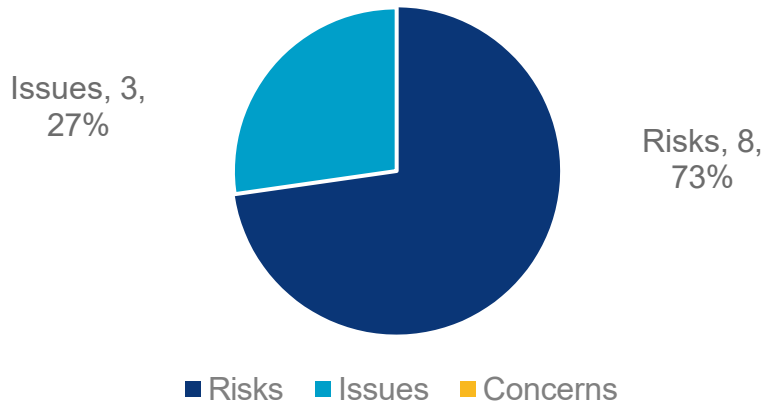
Mar '23	Category	IV&V Summary
M	Requirements	The SI may not provide a fully traceable RTM that traces System Test and UAT test case results back to individual requirements. Without an RTM, it remains unclear how the Project will determine if all requirements and expected functionality are implemented. If this dispute between PUC and the SI cannot be resolved, the 5/15/2023 system go-live date could be delayed, therefore, IV&V has escalated this to a medium risk.

Mar '23	Category	IV&V Summary
L	Training (OCM)	The Project is unable to provide dedicated resources to OCM activities. However, PUC continues to make efforts to mitigate this risk by streamlining their OCM efforts with their limited OCM resources. PUC intends to utilize email OCM communications and will leverage their internal SharePoint site to provide appropriate communications to system users and other project stakeholders.

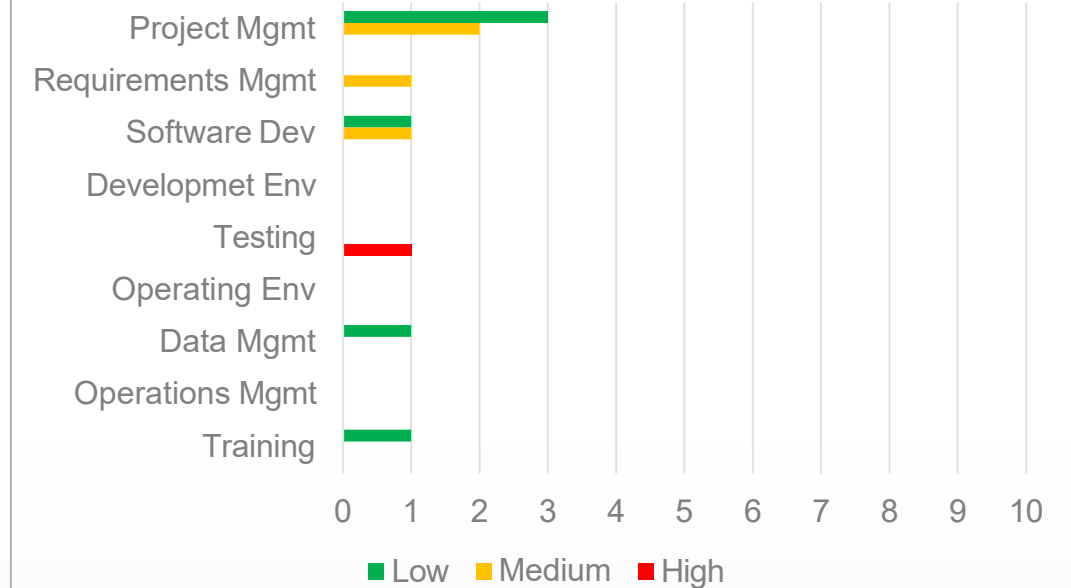
# Executive Summary

IV&V is monitoring eleven open findings. One issue (#24 – Insufficient Testing) is now a High criticality rating. One risk (#16 – Aggressive Schedule) was changed to an issue. Two preliminary concerns (#23 – OCM, and #25 – RTM) are now risks. Overall, there are three issues and eight risks. The three issues are related to Software Development, Testing and Project Management. Testing is High and the other two are Medium. Of the eight risks, two are rated Medium and fall under Project Management and Requirements Management and the remaining six are low risks with three in Project Management and one each in Data Management Software Development and Training/OCM.

All Findings by Type



Risks and Issues by Category and Criticality





The background is a solid blue color. On the left side, there is a cluster of white-outlined squares of various sizes, some of which are partially cut off by the edge. There are also several semi-transparent blue squares scattered across the background. On the right side, there is a single white-outlined square. In the bottom right corner, there is a white line that forms a partial square shape.

## **IV&V Findings and Recommendations**

# IV&V Findings and Recommendations

IV&V ID #14	Type: Risk	Status: In progress	Category: Project Management
	Rating: Low		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

3/31/2023: PUC SMEs and staff were available for testing Cycle 2 of UAT. However, one SME was on vacation and fell behind on their retesting and validation activities. To catch up and mitigate any negative impacts, the Project assigned other SMEs and the Business Analyst to assist.



# IV&V Findings and Recommendations

IV&V ID #14 (cont.)	Type: Risk Rating: Low	Status: In progress	Category: Project Management Date Opened: September 30, 2021		
Recommendations/Action Items			Period	Status	
The Project conduct detailed resource planning under the new schedule to avoid resource constraints.			Medium Term	In progress	
PUC PM and SI PM develop a plan to address these constraint and 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	Complete	
SI employ agile processes and methodologies so that progress can be made regardless of PUC resource availability.			Long Term	Complete	

# IV&V Findings and Recommendations

IV&V ID #15	Type: Risk	Status: In progress	Category: Project Management
	Rating: Low		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 the Project Plan, Risk Management Plan, Communication Plan and Change Management Plan, can be effective tools for projects of 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 PUC's needs.

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

## Updates

3/31/2023: The SI improved their deliverable quality in some instances. For example, PUC stated the 6.1 Training Plan was well developed. However, the 5.1 and 5.2 Testing deliverables were lacking in sufficient detail and did not meet PUC's expectations. After further discussions and updates, the Project resolved these concerns and the deliverables were approved.



# IV&V Findings and Recommendations

IV&V ID #15 (cont.)	Type: Risk Rating: Low	Status: In progress	Category: Project Management Date Opened: September 30, 2021	
Recommendations/Action Items			Period	Status
Although DEDs were developed for all deliverables, the SI should involve PUC before providing the draft deliverable to obtain feedback and expedite review cycles.			Long term	In progress
The SI should perform additional QA of deliverables prior to submission			Long term	In progress

# IV&V Findings and Recommendations

ID  
#16

Type: Issue

Rating: Medium

Status: In progress

Category: Project Management

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 can reduce document and system quality. When activities do not seem thorough, customer frustration can result. A rushed schedule can place unnecessary demand on PUC resources, especially if PUC resources are already fully utilized.

## Updates

3/31/2023: PUC continues to struggle to complete all testing activities on schedule and are unable to thoroughly test and retest defects. The testing schedule and duration is proving to be too short as PUC reported needing to sacrifice testing to meet project deadlines. Consequently, PUC requested to delay training to allow for more time for testing, however, the SI is urging PUC to keep the schedule as their training resources will not be available at a later date. The aggressive schedule was escalated to a Project issue from a risk and the Project may consider delaying go-live without delaying training.



# IV&V Findings and Recommendations

IV&V ID #16 (cont.)	Type: Issue Rating: Medium	Status: In progress	Category: Project Management Date Opened: September 30, 2021		
Recommendations/Action Items			Period	Status	
PUC could consider delaying the May 15, 2023 go-live date to provide more time to complete all Project activities satisfactorily. PUC reported no significant business impact if go-live is further delayed.			Medium term	Not started	
Provide reports that communicate progress clearly such as a burndown chart and sprint metrics such as planned user stories, completed user stories, cancelled user stories, and new/added user stories so as to clearly demonstrate if the project is on track or not.			Medium term	Complete	
Continue to provide UAT testing and QA testing metrics such as new defects, opened, ready for retest, and complete.			Medium term	In progress	

# IV&V Findings and Recommendations

IV&V ID #17	Type: Issue Rating: Medium	Status: In progress	Category: Software Development Date Opened: September 30, 2021
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**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) 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 communications resulting in productive meetings, good project documentation that provides clarity to complex topics, and overall, foster trust.

**Impact:** Inefficient analysis activities can negatively impact the Project. For example, 1) Project delays can occur if meetings do not meet intended goals and require additional clarification; 2) Rework and redesign can happen if accurate information was not solicited because participant expectations were not clear during the meeting; 3) Client buy-in and system acceptance may reduce.

## Updates

3/31/2023: Previous insufficient business analyses continue to impact the Project. During UAT, PUC reported over 700 issues and the SI continues to perform discovery and grooming activities. These issues are resulting in project delays, rework, redesign, and reduced client satisfaction. If the Project does not have enough time to address issues found, the solution may go-live with defects and/or sub optimal designs.





# IV&V Findings and Recommendations

IV&V ID #17 (cont.)	Type: Issue Rating: Medium	Status: In progress	Category: Software Development Date Opened: September 30, 2021		
Recommendations/Action Items			Period	Status	
PUC could consider delaying the May 15, 2023 go-live date to provide more time to complete all Project activities satisfactorily. PUC reported no significant business impact if go-live is further delayed.			Short term	Not started	
Institute continuous process improvement activities to refine the analysis processes and maximize their cadence without sacrificing quality.			Long term	In progress	
Request the SI track their cadence/velocity to improve estimation of task durations to assure planned milestone due dates are realistic.			Long term	In progress	

# IV&V Findings and Recommendations

IV&V ID #18	Type: Risk	Status: In progress	Category: Software Development
	Rating: Low		Date Opened: October 28, 2021

**Title:** Lack of attention to process improvement can lead to a system that simply automates existing processes instead of improving them

**Observation:** The extent to which the Project intends to focus on process improvements remains unclear. Pain points do not seem comprehensively tracked or considered during design sessions or whether all stakeholders are aware of or are actively utilizing the pain points list. While IV&V recognizes that change is difficult, some stakeholders appear to be hesitant to let go of familiar processes during the design sessions. It remains unclear if PUC has assigned the role of change champion to drive organizational process improvements.

**Context:** IT Projects that assign change champions and prioritize process improvement have an increased likelihood of resulting in systems that meet the organization's future business needs and improve system acceptance.

**Impact:** Lack of attention to process improvement can lead to a final product that fails to provide maximum value to users. Tracking pain points can be an effective OCM strategy to promote user adoption and increase user buy-in by providing visibility into how the system can resolve their pain points. Also, identifying and implementing opportunities for process improvement avoids SME frustration and rework.

## Updates

3/31/2023: PUC continues to observe areas where business processes could have improved. However, the Project decided it is too late to implement more process improvement at this time. Instead, the Project plans to identify and address additional improvements after go-live.

# IV&V Findings and Recommendations

IV&V ID #18 (cont.)	Type: Risk Rating: Low	Status: In progress	Category: Software Development Date Opened: October 28, 2021
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Recommendations/Action Items	Period	Status
Communicate to users and stakeholders process improvement that may not be optimized upon go-live but may be addressed during M&O.	Medium Term	Not started
Identify a PUC process improvement resource to drive/coordinate organizational process improvement efforts and assure system related processes are optimized. This resource could attend design sessions and validate designs support process improvement.	Short term	Not started
Work closely with the SI to identify opportunities for process improvement and implement associated features in the system being careful not to overwhelm users with too much change.	Long term	In progress
Formally engage stakeholders in identifying and tracking pain point and out-of-scope requirements so they are not forgotten and can be revisited in future project phases or other organizational initiatives.	Long term	In progress

# IV&V Findings and Recommendations

ID #19	Type: Risk	Status: In progress	Category: Project Management
	Rating: Low		Date Opened: November 30, 2021

**Title:** Key PUC project resources performing multiple roles could lead to schedule delays and significant project disruption.

**Observation:** IV&V has noted that at least two of the PUC project team members perform multiple roles and responsibilities on the project which may impact their ability to be successful if project demands increase.

In addition to serving as PUC's CDMS PM, this position also performs the following roles: Organizational Change Management lead, Process Improvement lead, Business Analyst Co-lead, User Acceptance Test (UAT) Co-lead, and Contract Administrator. In addition to performing ongoing operational responsibilities, the PUC CDMS Technical Lead is the Project IT Sponsor, Data SME, BA Co-Lead, and User Acceptance Test Co-Lead, and is heavily relied on for business analysis.

While these team members have indicated a strong commitment to project success, each has multiple competing priorities. The team members stated their support staff, including the new communications lead, will take on more responsibility to alleviate demands on their time. Also, the team members believe that the overall future workload will lessen.

It remains unclear if PUC staffing levels are appropriate for this project.

**Context:** Typically, Hybrid Agile projects require an increased level of customer engagement through all phases of the project. Overreliance on key resources can not only overtax and thereby reduce the effectiveness of these key individuals but also present a risk of significant project disruption in the event of their departure.

**Impact:** If the PUC PM and Technical SME are unable to transfer some responsibilities to other PUC resources, this could stretch them beyond their capacity which may lead to project delays and a decrease in quality in the project tasks they perform.

## Updates

3/31/2023: The PUC Project Manager and Technical SME are busy and report being "stretched thin" during UAT. Both resources were heavily involved in conducting, facilitating and supporting UAT testers throughout the testing process. The Business Analyst helped alleviate the demand on the core team. The PM and the Technical SME do not foresee future challenges as the majority of UAT is complete.

# IV&V Findings and Recommendations

IV&V ID #19 (con't)	Type: Risk Rating: Low	Status: In progress	Category: Software Management Date Opened: October 28, 2021
Recommendations/Action Items		Period	Status
Continue to focus on high priority and critical items		Medium term	In progress
Continue to leverage analyst to relieve the demand on the PUC PM		Medium term	In progress
The Project should plan for different contingencies depending on when the third PM becomes available.		Medium term	Complete
The Project should plan for different contingencies depending on the role of the original PM moving forward.		Medium term	Complete

# IV&V Findings and Recommendations

ID #20	Type: Risk	Status: In progress	Category: Data Management
	Rating: Low		Date Opened: March 31, 2022

**Title:** Data cleansing challenges could overwhelm PUC SMEs and could confuse users, reduce user buy-in, and/or lead to schedule delays if the Project went live with some bad data

**Observation:** IV&V is concerned with the poor quality of the legacy system data and whether PUC has the capacity to effectively cleanse their data. Further, if the project aims to meet data conversion milestones, the project may elect to go-live with some bad data to meet their planned go-live date.

**Context:** Typically, any bad data is addressed prior to go live to facilitate user adoption and to increase perceived system quality.

**Impact:** If all important data is not cleaned up prior to go-live, user adoption may be challenged, and user perception of the system may be diminished.

## Updates

3/31/2023: The Project reduced the number of anticipated records that would require clean-up after go-live. The Project originally estimated approximately 6000 duplicate account records that would need manual merging and it was unclear if the Project could complete this task before production users began using the system. However, the SI improved their pre-go-live automated cleansing and now estimate about 1600 duplicate records, which will result in less than 800 unique records. The Project anticipates cleaning up these records during the weekend before go-live as long as they have enough resources to work on these records at the time.

# IV&V Findings and Recommendations

IV&V ID #20 (cont.)	Type: Risk Rating: Low	Status: In progress	Category: Data Management Date Opened: March 31, 2022	
Recommendations/Action Items			Period	Status
The Project determine how long it will take to complete the post go live cleanup activities and if possible, complete after go-live is complete, but prior to production users using the system.			Medium term	In progress
Communicate to users and stakeholders the expected bad data and provide timelines and processes for fixing the bad data.			Medium term	Not started
Develop additional automation / pre-go-live strategies to clean data			Medium term	Not started

# IV&V Findings and Recommendations

IV&V ID #21	Type: Risk	Status: In progress	Category: Project Management
	Rating: Medium		Date Opened: May 31, 2022

**Title:** Delays in establishing card-not-present payment gateway could lead to schedule delays and increased cost

**Observation:** The Project elected to pause most activities for almost 3 months to procure a card-not-present payment processing vendor. Originally, the Project was planning on forego a public solicitation for these services, but the State Procurement Office required it. The SI stated the pause will be a no cost change order. .

**Context:** The Project has had past difficulties accurately estimating the procurement of the card-not-present service vendor and it is unclear how accurate these new estimates are.

**Impact:** Updated: If PUC is unable to secure a new payment processing vendor by the beginning of January 2023, the Project may be delayed. Original: If the PUC is unable to process payments on August 14th, 2022, the Project may be further delayed. Given the SI will not charge the customer for the initial 3-month delay, the budget impact could be minimal. However, the SI stated if payment processing is not available by 8/14, there is a \$10,000 a week fee for the additional schedule extension. PUC stated they are confident they can complete this procurement before the 8/14 deadline but if the Project is unable to meet these deadlines, the Project stated they have alternative plans.

## Updates

3/31/2023: The development of some payment processing functionality was still in progress and was not completed during UAT as scheduled. The Fiscal team is concerned as they were unable to test and verify the system is working as expected. The Project anticipates conducting testing and reviewing payment processing functionality early April to determine if payment processing functionality works as expected.



# IV&V Findings and Recommendations

IV&V ID #21 (cont.)	Type: Risk	Status: In progress	Category: Project Management		
	Rating: Medium		Date Opened: May 31, 2022		
Recommendations/Action Items			Period	Status	
PUC could consider delaying the May 15, 2023 go-live date to provide more time to complete all Project activities satisfactorily. PUC reported no significant business impact if go-live is further delayed.			Medium	Not started	
Closely monitor procurement for any signs of delay			Medium term	In Progress	
Develop mitigation strategies if procurement activities appear unfavorable			Medium term	In progress	

# IV&V Findings and Recommendations

ID #23	Type: Risk	Status: New	Category: Training (OCM)
	Rating: Low		Date Opened: February 28, 2023

## Title: Lack of PUC OCM resources could hinder OCM effectiveness

**Observation:** PUC has limited capacity to perform comprehensive OCM activities. OCM is currently being led by the PM with assistance from the PUC communications officer, both of which have limited capacity.

**Context:** A major goal of OCM is to ensure an organization adopts new systems and processes without causing negative impacts.

**Impact:** Insufficient OCM can lead to user dissatisfaction and a lack of buy-in. The need to address user concerns and confusion as they struggle to adapt to the new system/ processes could weigh heavily on project leadership and PUC staff the week of go-live.

## Updates

3/31/2023: PUC leadership recognizes the potential for this risk to be impactful, therefore, IV&V raised this Preliminary Concern to a Risk as PUC has limited capacity perform OCM activities. However, PUC continues to take efforts to mitigate this risk by streamlining their OCM efforts with its limited OCM resources. PUC intends to utilize email OCM communications and will leverage their internal SharePoint site to provide appropriate communications to system users and other project stakeholders. They will also provide public user communications on their existing public website 30 days prior to go-live.



# IV&V Findings and Recommendations

IV&V ID #23 (cont.)	Type: Risk	Status: New	Category: Training (OCM)		
	Rating: Low		Date Opened: February 28, 2023		
Recommendations/Action Items			Period	Status	
PUC could consider pushing the May 15, 2023 go-live date further out to provide more time to complete all OCM activities satisfactorily.			Medium term	Not started	



# IV&V Findings and Recommendations

IV&V ID #24	Type: Issue	Status: In progress	Category: Testing
	Rating: High		Date Opened: February 28, 2023

**Title:** Insufficient testing could lead to unexpected delays, increased burden on PUC testers, and reduced user buy-in.

**Observation:** The tests scripts the SI provided for system and user acceptance testing (UAT) were not comprehensive enough to assure full test coverage of the system. Given the significant number of defects (over 200) found in the first round of UAT, it remains unclear if SI system tests, prior to UAT, were comprehensive. The SI has yet to revise their test scripts to PUCs satisfaction. PUC has stated it appears SI regression testing efforts may be insufficient.

**Context:** One of the goals of testing is to reduce the number of defects found in subsequent project phases. For example, prior to UAT, system test should be conducted to minimize the number of defect introduced into the UAT environment so that UAT users can concentrate on determining if the system meet their needs instead of defects that should have been caught earlier.

**Impact:** Insufficient SI testing could increase the UAT level of effort if they are left with the additional burden of discovering defects missed by the SI, resulting in further Project delays. Further, overall impressions of the system and the improvements it will bring could be overshadowed by negative opinions voiced by PUC testers and thereby reduce user buy-in. If testing is not completed in a timely manner and/or if the SI is unable to assure each requirement has been fully met and comprehensively tested, system go-live could be delayed.

## Updates

3/31/2023: The SI may not provide a fully traceable RTM that traces System Test and UAT test case results back to individual requirements. A primary objective of UAT is to assure all contractual requirements are met and fully tested. Without an RTM, it remains unclear how the project will determine if UAT was successful. Cycle 2 of UAT was delayed because test scripts were not updated as a result of Cycle 1 changes, and the system go-live was pushed out to 5/15/2023. Many of the defects reported as part of Cycle 2 UAT were UAT test script defects. Other possible reasons for the high number of defects include the lack of sufficient system testing prior to UAT and the lack of regression testing when system fixes are applied. This lack of quality control increased the workload for the PUC project team members whose capacity is already constrained. This impacted the project budget as PUC has contracted an additional resource to fill testing gaps and to help mitigate this issue. PUC stated that it remains unclear if all users will be able to effectively perform their duties. IV&V elevated this issue priority to 'High' given these impacts.

# IV&V Findings and Recommendations

IV&V ID #24 (cont.)	Type: Issue Rating: High	Status: New	Category: Testing Date Opened: February 28, 2023
Recommendations/Action Items		Period	Status
As UAT is the last phase before production extend UAT as long as necessary to ensure the system is ready for go-live to PUC's satisfaction.		Medium term	In Progress
PUC and the SI perform significant ad-hoc testing		Medium term	In progress
PUC could consider pushing the May 15, 2023 go-live date further out to provide more time to complete all Project activities satisfactorily. PUC reported no significant business impact if go-live is further delayed.		Medium term	Not started

# IV&V Findings and Recommendations

IV&V ID #25	Type: Risk	Status: In progress	Category: Requirements
	Rating: Medium		Date Opened: February 28, 2023

**Title:** Insufficient requirements traceability could lead to missed requirements, rework, and budget/schedule impacts

**Observation:** The Requirements Traceability Matrix delivered by the SI lacks sufficient detail to fully map test scripts back to individual requirements, rather, the SI has elected to only map test scripts back to requirement categories. The SI has stated they will not provide this level of details that is typical of an industry standard RTM despite multiple requests from PUC.

**Context:** IEEE states: Requirements are the most important part of any software projects. Many software projects were failed due to incomplete requirements and lack of user involvements. It is very important to define all requirements at the beginning of any new project so that all members of the team can easily find what goals they should be striving toward. Requirement Traceability Matrix (RTM) is a document that contains all requirements presented by the customer or development team at the end of the life-cycle. The main purpose of creating Requirement Traceability Matrix is to check that all test cases are covered and should not be missed any functionality while testing."

**Impact:** Failure to trace test cases/scripts back to individual requirements could lead to a system has not been fully tested to assure all system requirements have been met.

## Updates

03/31/2023: The SI may not provide a fully traceable RTM that traces System Test and UAT test case results back to individual requirements. Without an RTM, it remains unclear how the Project will determine if all requirements and expected functionality are implemented. If this dispute between PUC and the SI cannot be resolved, the 5/15/2023 system go-live date could be delayed, therefore, IV&V has escalated this to a medium risk.



# IV&V Findings and Recommendations

IV&V ID #25 (cont.)	Type: Risk Rating: Medium	Status: In progress	Category: Requirements Date Opened: February 28, 2023	
Recommendations/Action Items			Period	Status
PUC Request the SI deliver a finalized fully traceable RTM that meets industry standards			Short term	Not started
If the PUC and SI come to an agreement, suggest the SI collaborate on ways to mitigate this risk			Short term	Not started



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## 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

n/a

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## 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.

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## IV&V Engagement Status

# IV&V Engagement Status




IV&V Engagement Area	Jan 23	Feb 23	Mar 23	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.
IV&V Deliverables				There are no known risks to upcoming IV&V deliverables.
IV&V Staffing				The IV&V team maintains the proposed team 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		
 <p>The engagement area is within acceptable parameters.</p>	 <p>The engagement area is somewhat outside acceptable parameters.</p>	 <p>The engagement area poses a significant risk to the IV&amp;V project quality and requires immediate attention.</p>

# Appendices

# Appendix A – IV&V Criticality Ratings

See definitions of Criticality Ratings below:

Criticality Rating	Definition
	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.
	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.
	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:
Weekly check-ins with PUC	PUC 5.1 Test Plan Meetings and Reviews
Monthly check-ins with PP	PUC 5.2 Test Plan Results
Weekly PM Meetings	PUC 6.1 Training Plan
CDMS – Risk Management Meeting	
UAT working / planning sessions	

# Appendix C – Upcoming IV&V Activities

Anticipated meetings to attend next period	Anticipated artifacts to review next period
Weekly check-ins with PUC	PUC 6.1 Training Plan (monitor)
Monthly check-ins with PP	
Weekly PM Meetings	
CDMS – Risk Management Meeting	
Deliverable Review Sessions	
Training Sessions	
Go/No Go Meetings	

# Appendix D – Recommendation Periods

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



**Solutions that Matter**