PRO V&V	**ENGINEER CHANGE ORDER (ECO) ANALYSIS FORM**
Manufacturer:	Clear Ballot Group
System:	ClearVote 2.3 (ClearCast Go and ClearCast Model D)
ECO Number:	SW-13406
ECO Description:	ClearCast duplicate target card

Overview:
ClearCast Go freeze symptoms reported during early voting for November 2022 election in Miami County, Ohio. To address this, CBG has implemented the following:

1. A software change was made to add a thread lock around the encryption and HMAC functions. This modification prevents the system from accessing the OpenSSL-FIPS library simultaneously.

2. For ClearCast Model D, the application software was modified identically, but also required additional updates for build maintenance outside of the application software.

Products Affected: ClearCast Go Version 2.2.a and ClearCast Model D Version 2.2.9

Per CBG, for both ClearCast Go and ClearCast Model D hardware, the corrective action will be delivered via an install of version 2.2.b.

Supporting Documentation:
ECO Request Form SW-13406.pdf *(CBG ECO)*
Clear Ballot ClearCast Target Card RCA Final.pdf *(RCA)*
Cover Letter – ECO Request SW-13406.pdf *(CBG Engineering Change Order Request SW-13406)*
2.2 Encryption Unit Test Instructions v1.1.pdf *(CBG Encryption Test Instructions)*
2.2b ClearCast Test Cases.pdf *(CBG Test Cases)*
2.2b ClearCast Test Report.pdf *(CBG Test Report)*
ECO Accuracy Results.pdf *(Pro V&V Accuracy Test Results)*
Encryption Test Results *(Pro V&V Test Results)*

Engineering Recommendation:
This evaluation was completed under the Change Order program and not as a system modification. Source Code Review, Technical Documentation Review, Trusted Builds, Functional Regression Testing (consisting of verifying CBG testing performed as part of the RCA), and Accuracy Test conducted by Pro V&V for recommendation. Pro V&V reviewed CBG-submitted test cases and results and performed an Encryption Test for functional regression testing. Functional Regression Testing was performed on both the current and the modified versions and results were compared to verify successful implementation. Accuracy Testing was performed utilizing each supported ballot size.

Based on successful testing results, Pro V&V Pro V&V determined the changes did not adversely affect system reliability, functionality, capability, safety, security, or operation. The system tested was verified to be accurate during testing with the actual results matching the expected results. No issues were encountered during testing.

The Source Code Review was performed by doing an automated review using ExamDiffPro software. The previously certified source code versions (ClearCast Go Version 2.2.a and ClearCast Model D Version 2.2.9) were used as the baseline for the comparison against the newly updated source code with the changes incorporated (version 2.2.b). Pro V&V verified the only changes made to the newly submitted source code were the changes described in the submitted supporting documentation and updating the version number.

Pro V&V determined the modification was successfully implemented and no additional testing is required. Pro V&V determined the modification successfully addressed the issue.

Pro V&V recommends the modification be considered a minor software change. This recommendation is based on the software change having the following general characteristics: (1) Update a discrete component of the system and do not impact overall system functionality; (2) Do not modify the counting or tally logic of a component or the system (formatting changes to reports are allowable); (3) Do not affect the accuracy of the component or system; (4) Do not negatively impact the functionality, performance, accessibility, usability, safety, or security of a component or system; (5) Do not alter the overall configuration of the certified system; and (6) Can be reviewed and/or tested by VSTL personnel in a short amount of time (approximately less than 100 hours).

All test artifacts (revised code, generated hash values of source code and trusted builds, and all applicable test cases and/or results) were submitted to the EAC for review along with this ECO Analysis.

Engineering Analysis: Minor – No Additional Testing Required

Reviewer:	**Approver:**
Wendy Owens Printed Name	Michael L. Walker Printed Name
Wendy Owens Signature	Michael L. Walker Signature
03/09/2023 Date	03/09/2023 Date