

# Complex Elections: Making Voting More Robust and Trustworthy

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by

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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# Complex Elections: Making Voting More Robust and Trustworthy

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## ABSTRACT

As a part of the Virginia Cyber Navigator Internship Program, the Chesterfield County's General Registrar's office drafted an incident response plan to give local election offices the resources to comply with the Locality Election Security Standard (LESS), a set of state-mandated security procedures to better secure elections. Virginia election offices are mandated to operate by the state constitution, yet they must also work together with local officials and resources in order to effectively complete an election. Election officers must contend with the court system, state laws, and a myriad of county services during election season. Our drafted incident response plan integrated the election office's plan with other county services and contingencies, clearly defining rules and procedures that had previously been a matter of precedent and individual interpretation. Chesterfield County will be responsible for implementing the suggestions made in the incident response plan. Training for the plan will be handled by the County, along with regular revisions and testing.

## 1. INTRODUCTION

Following high profile and contentious American elections, in 2019 the Virginia

state government decided to create a standard for security practices in all local election offices called the Locality Election Security Standard. LESS is meant to provide guidance to local governments on how to conduct their election offices to maintain security and resilience. The standard covers a broad range of topics from password management to personnel protocols. While the entire list of standards is not mandatory, all localities must meet the controls identified as baseline within the standard with the intention to continue maturing the program beyond baseline controls. LESS serves as a source of suggested best practices for localities.

Recognizing that many localities do not have the money, time or resources to comply with many elements of LESS, a team of several college interns created a program to promote a locality's compliance with LESS. The internship program pulled students from many Virginia universities, specifically computer science students with an interest in cybersecurity. I was a member of the inaugural class of VA-CNIP (Virginia Cyber Navigator Internship Program), and my partner was assigned to Chesterfield County.

## **2. RELATED WORKS**

The catalyst for the Virginia Cyber Navigator Program is the law creating LESS and creating the need for localities to survey and improve their election infrastructure security. While my internship was only concerned with compliance with LESS, the law creating it also lays a foundation for annual reviews and updates for localities which would have to fit into the timeline of LESS if Chesterfield County decides to act on the recommendations from VA-CNIP (HB 2178, 2019).

Election offices handle more than just voting. The entire system of elections from voter registration to vote tallying, to personnel and volunteer management has to flow through the local election office. Such a large network with sensitive information, including all the information needed to register to vote, needs to be secure, not just the machines on election day. A particularly cumbersome and often unrecognized election security hazard are the databases where voter information is stored. Every state has its own implementation. The relatively unknown and under-researched nature of these databases make them vulnerable (Norden, et al., 2017).

The LESS standard does include the voting machines, but these machines are already subject to many laws and regulations, as well as public scrutiny. The standard also includes the office as a whole, including all devices and personnel with access to the election office, expanding the scope beyond what the public is often most concerned about. As noted by Norden, et al. (2017), the large attack surface of an election office needs to be studied and protected. LESS serves to guide local election offices in the

best way to protect the entire office from security incidents.

## **3. PROCESS DESIGN**

The internship program only serves to provide local governments with the resources, in this case interns, to comply with the LESS standard. The following are the specific procedures and requirements from Chesterfield County, given to the interns.

### **3.1 Requirements**

Chesterfield County needs an election system that is resilient and reliable in extreme circumstances. The county is concerned about public image and trust due to recent election events, and the requirements sent by the state. The LESS standard only gives a rough outline with the aforementioned principles. Any details or specifics have to be created with the county's specific structure and organization. We were able to leverage existing documents that filled roles adjacent to incident response (like continuity of operations) to see the kind of document that county expects and regularly uses. Enabling each locality to pivot and implement controls specific to their needs and environment is crucial for successful integration in every locality. The state only provides guidelines, so the approval and popularity of the plan with county officials and leadership is the most important factor in the adoption of the plan. Interviews were conducted for all stakeholders and officials to guarantee support and integration with county procedure.

### **3.2 Key Components**

The scope of the document is an important specification as the incident response plan is

designed to fill a specific purpose relative to the LESS requirements. The plan also needed to integrate with the existing documentation for the County Election Office. The LESS requirements are vague, much of the structure for the plan was determined by the standard documentation used by the county as well as from the standard set of documentation and management practices utilized by Chesterfield County.

### **3.3 Challenges**

There must be an efficient use of resources and reliable communication between county officials and other stakeholders. Simply understanding what should be in the incident response plan and how exactly the plan will direct the county during a crisis was the biggest challenge. There isn't a standard template for the specifics of any incident as every organization will require wildly different procedures, there are 2 fundamental questions we had to ask when starting. Firstly, the scope of the document was established (to prevent scope creep). Chesterfield County asked that our incident response plan applied to the General Registrar's office and covered any type of incident. Secondly, who are the major stakeholders and participants needed for an effective incident response, either because they need to be made aware or because they serve a particular position?

### **3.4 Implementation**

Stakeholder interviews (sometimes multiple interviews for one person) covered tasks that where in existing documentation and suggestions for the new incident response plan. Both the interviews and the existing documents from the election office and other the county departments gave a picture of

where the county was currently and the interviews provided specific steps for moving forward. For example, LESS requires specifics like regular review and training for the incident response plan, basic infrastructure that can be easily overlooked.

Consistent communication with stakeholders ensured the incident response plan remained in scope and satisfies all the requirements from the election office. Reviewing dated county plans and policies meant that some inconsistencies and potential improvements were discovered. The drafted incident response serves as a recommendation, along with other policies and any future organizational changes that may occur to the election office. Of course, these elements were included in the final list of recommendations, along with the proposed incident response plan.

Only creating one draft of the plan would be incomplete and lead to an inferior product, so we conducted a table top exercise to test the plan against existing infrastructure and address any unforeseen consequences. The exercise was an organized group discussion, where all stakeholders were gathered and given a possible scenario or incident. Then the participants were asked pointed questions to guide discussion, obviously the participants brought up relevant subjects as well. Everything was recorded and used to address any errors or blind spots in the incident response plan. The table top exercise will be used regularly to test the plan and adapt with the county, but this first test had the primary function of revising a rough draft of the plan.

#### **4. RESULTS**

The incident response plan gives Chesterfield County the resources it needs to effectively respond to incidents while maintaining records and audibility. After the inaugural table top exercise, we have set in motion regular exercises and tests to revise the plan and train new employees and stakeholders.

Our client for this project was the election officers, all documentation and recommendations are addressed to the Chesterfield election office. However, the election office will need additional resources and interdepartmental cooperation. Outside county officials and leadership must be aware of the recommendations and findings. As interns, our role was not to implement changes but to provide recommendations for specific actions that will bring the county in line with the LESS standard.

#### **5. CONCLUSION**

As the summer of 2022 was the first iteration of the Virginia Cyber Navigator Internship Program, there were many speed bumps and inconsistencies. While I cannot speak on behalf of the program as a whole or the experiences of other teams in other localities, my work in Chesterfield County was narrow in scope but very thorough. Chesterfield County applied to receive interns, highlighting their need for compliance with the LESS incident response sections. My time learning about Chesterfield County's specific case made clear the unique challenges and advantages of federalism in the implementation in American elections.

#### **6. FUTURE WORK**

The internship's only purpose is to provide recommendations for Chesterfield County. All future work is the responsibility of Chesterfield County. For the Virginia cyber navigator internship, more localities will be assigned interns as the LESS standard changes every year.

#### **7. ACKNOWLEDGMENTS**

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