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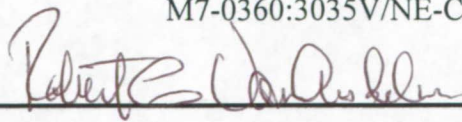
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NASA INSPIRE Tier 3
Kennedy Space Center
Abstract
Diaz-Rivera, Alexander
July 27, 2009

Information Security

Reviewed by:
Robert Van Arsdalen
M7-0360:3035V/NE-C



Diaz-Rivera, Alexander

Abstract

Information Security

NASA/INSPIRE Tier 3

Kennedy Space Center

Mentor: Robert Van Arsdalen

June 8 - July 31, 2009

1. Following the mandate set by the Federal Information Security Management Act of 2002 (FISMA), the National Institute of Standards and Technology (NIST) created guidelines for securing sensitive but unclassified information in federal institutions. These guidelines affect how information is stored, transferred, and secured in NASA, particularly when dealing with computers. My mentor's job is to make sure that the standards set by NIST are met at Kennedy Space Center's NE Directorate lab facilities. However, keeping track of every lab's security vulnerabilities in KSC can be overwhelming. My job is to make it easier for my mentor to organize information for each lab.
2. The Lab inventories, vulnerabilities, and other related documents will be provided to me by my mentor's co-worker, Ross Nordeen. I will then translate all of the information given to me into an easily navigable database. To organize this information, I must first make a few basic tables, within a master database, to combine all of the related data together. From those tables, I will create queries that will show specific information from the tables. From those queries and tables, I can create forms that organize the data into a more visually appealing presentation. Aside from showing information, the forms can also run programmable functions for purposes such as navigation. I plan to have all of the major forms linked together through the use of navigational, macro-embedded buttons.
3. The NE labs located throughout Kennedy Space Center are assessed by the auditors in the division that I work with. In each lab, the auditors receive a copy of the current inventory list, a lab description document that provides the auditor with basic information about the lab and diagrams of the lab's floor plan and network configurations. The auditors have a checklist of requirements that each asset in the lab must meet. The auditor reports findings for the security requirements that are not implemented and assigns a vulnerability level of low, moderate, or high to the missing requirement based on NIST's standards.
4. Throughout this internship, I mainly learned lessons about management, both on the business and personal level. While compiling all of the information provided to me, I also learned more about Microsoft Access and its various functions. Before my internship, I only knew how to make simple queries, forms and reports in Access. Now, I am able to create navigational forms, known as switchboards, I have also gain knowledge of several life lessons as well; most predominantly, the value of patience.
5. I appreciate all of the help and guidance that I received from Mr. Robert Van Arsdalen, Mr. Ross Nordeen, and Mr. Clyde Box throughout this internship.

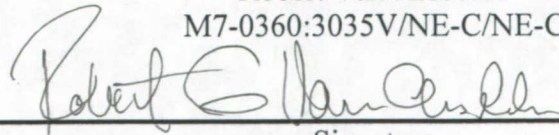
NASA INSPIRE Tier 3
Kennedy Space Center
Final Paper
Diaz-Rivera, Alexander
July 27, 2009

Information Security

Reviewed by:

Robert Van Arsdalen

M7-0360:3035V/NE-C/NE-C



Signature

Final Paper
NASA/INSPIRE Tier 3
Kennedy Space Center
Mentor: Robert Van Arsdalen
June 8 - July 31, 2009

IT Security at KSC

For over forty years, the Kennedy Space Center, or KSC, has been the main spacecraft launching site for the National Aeronautics and Space Administration (NASA). KSC is more than just a launching facility, though. KSC houses many different types of labs that focus primarily on technological and biological advancement for space exploration. These labs contain an abundant amount of information that can be used for other humanitarian purposes. Likewise, there is information stored in KSC that could potentially be used for malicious purposes. Should any of this information ever fall into the wrong hands, the United States could be threatened. Therefore, there is a need to protect all of the sensitive information in KSC; this job is done by IT security assessors.

The need for IT security in government facilities was presented by the Federal Information Security Management Act of 2002 (FISMA). FISMA set out a mandate that emphasizes the importance of protecting information in federal agencies; however, FISMA does not provide actual explicit guidelines. From this mandate, the National Institute of Standards and Technology (NIST) created guidelines for securing sensitive but unclassified information in federal institutions. While these guidelines are not entirely explicit, NIST provides the main guidelines for securing information. These guidelines affect how information is stored, transferred, and secured in NASA, particularly with the management of electronic information located on computers. My mentor's job is to make sure that the standards set by NIST are implemented by Kennedy Space Center's NASA Engineering (NE) Directorate lab facilities, as well as the systems being developed by Constellation for the Launch Control System and Ground Systems. However, keeping track of every lab's security vulnerabilities in KSC can be overwhelming. My job is to make it easier for my mentor to organize information for each lab.

The NE labs located throughout Kennedy Space Center are assessed by the auditors in the division that I work with. In each lab, the auditors receive a copy of the current inventory list, a lab description document that provides the auditor with basic information about the lab and diagrams of the lab's floor plan and network configurations. The auditors have a checklist of requirements that each asset in the lab must meet. The auditor reports findings for the security requirements that are not implemented and assigns a vulnerability level of low, moderate, or high to the missing requirement based on NIST's standards.

CM-8 INFORMATION SYSTEM COMPONENT INVENTORY

Control: The organization develops, documents, and maintains an inventory of information system components that:

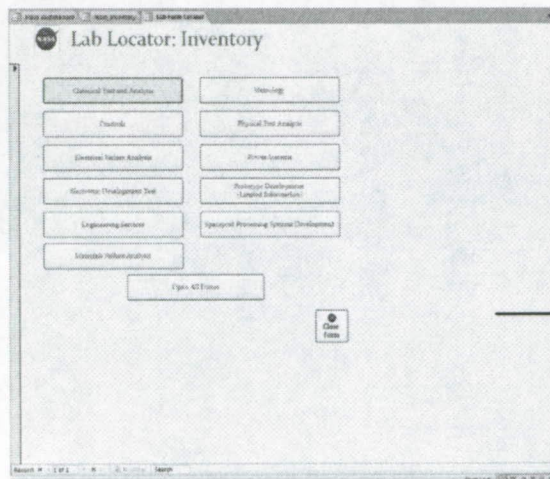
- Accurately reflects the current information system;
- Is consistent with the authorization boundary of the information system;
- Is at the level of granularity deemed necessary for tracking and reporting;
- Includes [Assignment: organization-defined information deemed necessary to achieve effective property accountability]; and
- Is available for review and audit by designated organizational officials.

Supplemental Guidance: Information deemed to be necessary by the organization to achieve effective property accountability can include, for example, hardware inventory specifications (manufacturer, type, model, serial number, physical location), software license information, information system/component owner, and for a networked component/device, the machine name and network address. Related controls: CM-2, CM-6.

In this particular control, NIST provides guidelines for maintaining a system inventory.

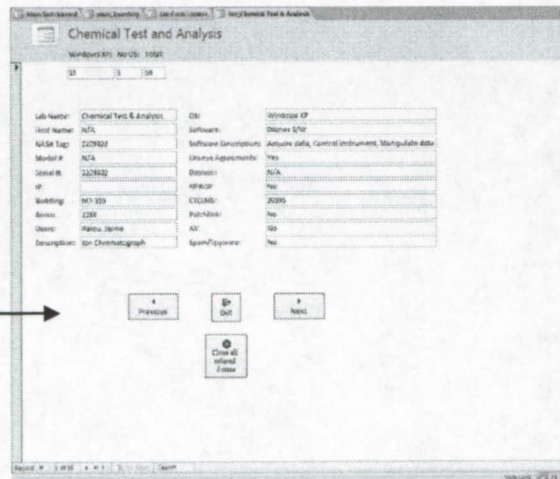
The Lab inventories, vulnerabilities, and other related documents were provided to me by my mentor's co-worker, Ross Nordeen. I translated all of the information given to me into an easily navigable database. To organize this information, I made a few basic tables, within a master database, to combine all of the related data together. From those tables, I created queries that show specific information from the tables. From those queries and tables, I created forms that organize the data into a more visually appealing presentation. Aside from showing information, the forms also run programmable functions for purposes such as navigation. I have all of the major forms linked together with navigational, macro-enabled buttons.

Figure 1



"Lab Locator" page lists the lab names.

Figure 2



Clicking on a lab name will open its respective form.

Prior to working at KSC, I was not entirely sure as to what kind of work was done at NASA other than what I have seen in the media. I knew that KSC was more than just a place dedicated to spacecraft launching, but I had no idea as to what went on inside of the rest of the center. Throughout this internship, though, I learned how the management in KSC works. While compiling all of the information provided to me, I learned more about Microsoft Access and its various functions. My knowledge of Microsoft Access was also limited prior to beginning my internship. Before my internship, I only knew how to make simple queries, forms and reports in Access. Now, I am able to create navigational forms, known as switchboards, and programmable macros.

Aside from learning about STEM related practices and lessons, I have also gained knowledge of several life lessons as well; most predominantly, the value of patience. One of the first things that my mentor told me was that the area that he works in is very busy, and that a good sense of patience was needed. Many times, I found myself frustrated when I found that I either had too much or too little to do at work. However, I learned that patience reaped rewards. In other words, I found through my experience that whatever stress I had to deal with presently paid off in the end. An example of when I needed to rely on patience is when I began working for my mentor. After sitting through two days of orientation, I was eager to work on whatever project was assigned to me. However, I was not going to receive my work assignments until the day after my first workday. In order to be proactive about waiting for my project, I decided to spend my free time by refreshing my knowledge of Microsoft Access. Doing this not only changed attitude, but it also prepared me for the next day's assignment.

On account of the great opportunity presented to me by this internship program, I am glad to have been fortunate enough to be a part of a NASA center working environment. This summer, I was able to indirectly work with some of the NASA labs as a part of an IT security assessment. I have learned about some of the STEM related disciplines in NASA as well as many life lessons that I will take to heart for the rest of my life. I have also learned about a different kind of job at KSC that while it does not contribute to space exploration, it helps protect the center from exposing sensitive information.

I am grateful that an internship like INSPIRE exists to offer opportunities to students, like me, who strive for a career in science, technology, engineering, or mathematics. For this, I would like to thank Mrs. Priscilla Moore, Mr. Jim Gerard, and many others for coordinating the INSPIRE experience for KSC. I appreciate all of the help and guidance that I received from my mentor, Mr. Robert Van Arsdalen, and his co-workers, Mr. Ross Nordeen and Mr. Clyde Box. I am especially grateful for the various tours and other events that I was a part of and the individuals responsible for directing these events, including: Mr. Lynn Svedin, Mrs. Laurie Griffin, Mrs. Karen Mendoza, Mr. Eduardo Lopez Del Castillo, and Mr. Rey Diaz. I would also like to thank my family, Rey, Iris, and Angelica Diaz, for being extremely supportive of me. If it were not for everyone's collective effort, I would have not been a part of the INSPIRE program this summer.