



NOVEC **EXansion **I**dentification **S**ystem** **System Requirement Specification**

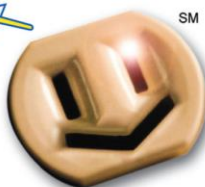
February 12 2015
Revision B



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Investing in Our Communities



NOVEC EXpansion Identification System System Requirement Specification

SYST 699 - Fall 2015

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Version	Revision Status	Date
A	Initial Release	Feb 12, 2015
B	Second Release Sections 2,3,4,5,6	Mar 10, 2015

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1.0 Introduction

This section contains a brief description of NEXIS system background and capabilities.

1.1 Purpose

The Northern Virginia Electric Cooperative (NOVEC) is one of the largest electric distribution cooperatives in the country. NOVEC provides their services to over 155,000 homes and businesses in the Northern Virginia region. NOVEC conducts load analysis to predict future needs and load demands. The results of these predictions serve as a decision making tool to determine where to deploy assets and the quantity of energy to purchase from producers. Current predictions are based off of land use categories and parcel size. The current system, while effective, fails to take future development projects into account. The NOVEC EXpansion Identification System (NEXIS) will provide NOVEC the ability to collect and store data on current development projects. This data will allow NOVEC to develop more accurate demand models.

1.2 Document Overview

This System Requirements Specification (SRS) describes the functional and performance requirements for NEXIS. The requirements set provided in this document represent the full set of requirements for NEXIS. These requirements will be used for both the development and testing of the system.

1.3 Scope

NEXIS is an automated data collection tool that collects, stores, and reports data to user. This system eliminates the time prohibitive task of collecting thousands of data points about ongoing construction projects by hand. NEXIS uses publicly available data from Loudoun County to populate a database and display data to users for use in predictive demand models. The system provides three high level capabilities data collection, data storage, and data reporting.

The first required capability is data collection. NEXIS is capable of parsing three online sources and processing the data prior to storage. The processing will require that the data be checked for content, anomalies, and uniqueness. NEXIS first flags any missing data fields from a newly detected record and attempts to fill in missing fields with data available from previously stored records for the same project. Next the system checks for any anomalies against previous records. These anomalies are flagged for user review. Finally the system verifies that the record is unique. If a record exists that contains the identical data for the same project then the new record is not added to the database. The data processing conducted by NEXIS insures that all data stored in the system is as accurate and complete as technically feasible.

The second capability demonstrated by NEXIS is data storage. NEXIS stores all applicable data in a database for ease of access by users. The storage of collected data eliminates the need to constantly collect data from the various online sources. Additionally, storing data locally increases the speed of queries. This provides easier access to the data needed by the predictive models.

The final capability of the NEXIS system is data reporting. The database will be accessible by users through an intuitive User Interface. This GUI will provide users a

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data visualization tool and exportable reports. These reports will be human readable and easily incorporated into NOVEC's models.

2.0 Functional Requirements

This section provides all of the functional requirements for the NEXIS system.

ID	Requirement Text
NXS-F-001	The system shall provide the capacity for users logging on or off.
NXS-F-002	The system shall provide no less than three types of user roles.
NXS-F-003	The system shall provide for multiple users to access each role.
NXS-F-004	The system shall provide each user with an individualized login.
NXS-F-005	The system shall provide a general user role.
NXS-F-006	The system shall provide the general user with the capability to request database updates.
NXS-F-007	The system shall provide the general user with the capability to query database.
NXS-F-008	The system shall provide the general user with the capability to generate reports.
NXS-F-009	The system shall provide an analyst role that maintains user priveleges and analyst specific priveleges.
NXS-F-010	The system shall provide the analyst role with the capability to revise records.
NXS-F-011	The system shall provide the analyst role with the capability to remove records.
NXS-F-012	The system shall provide the analyst role with the capability to add records.
NXS-F-013	The system shall provide an administrator role that maintains analyst role priveleges and administrative specific priveleges.
NXS-F-014	The system shall provide the administrator role with the capability to start the system.
NXS-F-015	The system shall provide the administrator role with the capability to stop the system.
NXS-F-016	The system shall provide the administrator role with the capability to manually backup the system.
NXS-F-017	The system shall provide the administrator role with the capability to re-deploy the software from backup.
NXS-F-018	The system shall provide the administrator role with the capability to deploy software patches.
NXS-F-019	The system shall provide the administrator role with the capability to read system log files.
NXS-F-020	The system shall provide the administrator role with the capability to collect system log files.

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NXS-F-021	The system shall provide the administrator role with the capability to create user accounts with the following information: 1) Username 2) Password 3) Email
NXS-F-022	The system shall provide the administrator role with the capability to remove user accounts.
NXS-F-023	The system shall provide the administrator with the capability to assign priveleges to user roles.
NXS-F-024	The system shall administrator shall assign priveleges based on capabilities needed.
NXS-F-025	The system shall provide data collection from the Loudoun County Available Land webpage.
NXS-F-026	The system shall provide data collection from the Loudoun Online Land Application webpage.
NXS-F-027	The system shall collect all data defined in the data dictionary.
NXS-F-028	Data shall be automatically collected from the specified web pages upon user initiation.
NXS-F-029	The system shall provide the collection of data at least once every 30 days.
NXS-F-030	The system shall have the capability to collect data from all websites upon user initiation.
NXS-F-031	The system shall not create new records for duplicative data.
NXS-F-032	When a collected data field is empty the system shall populate the field with available existing data from the same project.
NXS-F-033	After acquisition of the development data the system shall check for duplicative entries.
NXS-F-034	After acquisition of the development data, the system shall format the data to the data dictionary output.
NXS-F-035	After acquisition of the development data, the system shall perform a consistency check of the data against previous records from the same project, using the fields defined in the data dictionary.
NXS-F-036	The system shall display the results of user queries.
NXS-F-037	The system shall display database updates on request.
NXS-F-038	The system shall list the new data entries, after updating the database.
NXS-F-039	The system shall list all new entries with missing data fields, after updating the database.
NXS-F-040	The system shall provide generated reports in a human readable format.
NXS-F-041	The system shall generate reports containing the results of user queries.

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NXS-F-042	The system shall provide a manual user backup of the system and all of its data.
NXS-F-043	The system shall provide a configurable timer of the time desired between automatic pulls.
NXS-F-044	The system shall keep a timer of time since last data pull.
NXS-F-045	The system shall automatically pull data if configured pull timer is less than time since last pull.
NXS-F-046	The system shall output changes to the database during each query with the following format: 1) Number of new records 2) Number of updated records 3) Number of removed records
NXS-F-047	The system shall send an email notification to the userbase with the following information in the email body: 1) Number of new records 2) Number of new records with missing data fields 3) Output of new records with missing data fields 4) Number of updated records 5) Number of removed records
NXS-F-048	The system shall allow data to be sorted by user request using the fields defined in the database dictionary.
NXS-F-049	The system shall provide saliency to reporting on projects of 50 homes or more
NXS-F-050	The system shall provide end-to-end automated data collection ability
NXS-F-051	The system shall provide scalability to the collection and storage of the predicted future service area for counties outside of Loudoun County
NXS-F-052	The system shall enforce restrictions against data altering
NXS-F-053	The system shall provide automatic audits of data updates
NXS-F-054	The system shall provide restricted user access to modify data

3.0 Architecture Requirements

The system architecture dictates that certain minimal components be implemented. The description herein is solution independent outline of the architecture.

ID	Requirement Text
NXS-T-001	The system shall operate on a personal computer with a windows operating system.
NXS-T-002	The system shall operate with Google Chrome web browser.

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NXS-T-003	The system shall store all collected data in a database, using either: 1) ORACLE 2) MySQL
NXS-T-004	The system shall interface with HTML webpages.
NXS-T-005	The system shall have a web based user interface.
NXS-T-006	The system shall have a custom or open source web scraper module.
NXS-T-007	The system shall have a custom consistency checking module.
NXS-T-008	The system shall be written in python programming language.
NXS-T-009	The system shall interface with NOVEC's internal network structure.
NXS-T-010	The system shall have separate interfaces to LCAL and LOLA webpages.
NXS-T-011	The system shall limit use of data to that available for public record

4.0 Operating Requirements

The system operating environment section defines the minimum software and hardware requirements for system operation.

ID	Requirement Text
NXS-O-002	The system shall require a user to provide a username and password to access the system.
NXS-O-003	The system shall lock a user account that has unsuccessfully attempted a login more than five times.
NXS-O-004	The system shall allow query of the database.
NXS-O-005	The system shall allow storage of generated reports to the users local machine.
NXS-O-006	The system shall have the capability to populate the database with data that was previously backed up.
NXS-O-007	The system shall display login errors to the user.
NXS-O-008	The system shall report all locked usernames to the admin.
NXS-O-009	The system shall be started from a command line interface.
NXS-O-010	The system shall automatically start all processes when a start command is issued.
NXS-O-011	The system shall be shutdown from a command line interface.
NXS-O-012	The system shall automatically shutdown all processes when a shutdown command is issued.
NXS-O-013	The system shall keep a system log of the following events: 1) login attempts 2) locked accounts 3) Missed connections to externally polled websites

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NXS-O-014	<p>The system shall log all data consistency items of the following events:</p> <ol style="list-style-type: none"> 1) Number of new records 2) Number of new records with missing data fields 3) Output of new records with missing data fields 4) Number of updated records 5) Number of removed records 6) Number of invalid records
NXS-O-015	<p>The system shall log each event with the following information:</p> <ol style="list-style-type: none"> a. System timestamp b. Process/Record ID c. IP, system, or record name affected d. System detailed description

5.0 Non-functional Requirements

ID	Requirement Text
NXS-N-001	The system shall have an availability of 0.999.
NXS-N-002	The system shall be capable of storing 1 Tb of development data.
NXS-N-003	The system shall use 50% or less of the total available memory.
NXS-N-004	The system shall use 50% or less of the total CPU usage.
NXS-N-005	The system shall provide the storage of no less than 10,000 individual records

6.0 Implementation Requirements

ID	Requirement Text
NXS-I-001	The system implementation shall comply with the "terms of use" of the Loudoun Online Land Application database
NXS-I-002	The system implementation shall comply with the "terms of use" of the Loudoun County Available Land database
NXS-I-003	The system implementation shall comply with the "Bylaws of the Cooperative"
NXS-I-004	The system shall comply with the fair use policies of data published at the county level
NXS-I-005	The system shall comply with NOVEC "system backup procedure"s established by NOVEC's IT support services.
NXS-I-006	The system shall comply with NOVEC "networking procedures" established by NOVEC's IT support services.
NXS-I-007	The system shall comply with NOVEC "database deployment procedures" established by NOVEC's IT support services.
NXS-I-008	The system shall be deployed with a focus on loudoun county

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NXS-I-009	The system shall manage the creation of reports formatted to integrate with the legacy NIS
NXS-I-010	The system shall integrate with legacy hardware infrastructure