FIMA Made Progress Modernizing Its NFIP System, but Data Quality Needs Improvement

Homeland Security

November 2, 2020

MEMORANDUM FOR: The Honorable Peter T. Gaynor
Administrator
Federal Emergency Management Agency

FROM: Joseph V. Cuffari, Ph.D.
Inspector General

JOSEPH V CUFFARI

Digitally signed by JOSEPH V CUFFARI
Date: 2020.10.29 15:12:11 -04'00'

SUBJECT: *FIMA Made Progress Modernizing Its NFIP System, but Data Quality Needs Improvement*

Attached for your information is our final report, *FIMA Made Progress Modernizing Its NFIP System, but Data Quality Needs Improvement.* We incorporated the formal comments from the Federal Emergency Management Agency (FEMA) in the final report.

The report contains three recommendations aimed at improving data quality in the NFIP system. FEMA concurred with all three recommendations. Based on information provided in FEMA's response to the draft report, we consider all three recommendations open and resolved. Once your office has fully implemented the recommendations, please submit a formal closeout letter to us within 30 days so that we may close out the recommendations. The memorandum should be accompanied by evidence of completion of agreed-upon corrective actions and of the disposition of any monetary amounts. Please send your response or closure request to OIGAuditsFollowup@oig.dhs.gov.

Consistent with our responsibility under the *Inspector General Act,* we will provide copies of our report to congressional committees with oversight and appropriation responsibility over the Department of Homeland Security. We will post the final report on our website for public dissemination.

Please call me with any questions, or your staff may contact Sondra McCauley, Assistant Inspector General for Audits, at (202) 981-6000.

Attachment

DHS OIG HIGHLIGHTS
FIMA Made Progress Modernizing Its NFIP System, but Data Quality Needs Improvement

Why We Did This Audit

In October 2019, the Federal Emergency Management Agency's (FEMA) Federal Insurance and Mitigation Administration (FIMA) modernized the National Flood Insurance Program (NFIP) system. The NFIP system is expected to contain reliable policies and claims data to accurately track flood-affected properties and set flood insurance premiums. We conducted this audit to assess the extent to which FIMA has addressed data quality issues in its NFIP modernization effort.

What We Recommend

We made three recommendations to improve data quality in the new NFIP system and educate stakeholders about existing NFIP data quality issues limiting use of those data.

For Further Information:
Contact our Office of Public Affairs at (202) 981-6000, or email us at
DHS-OIG.OfficePublicAffairs@oig.dhs.gov

What We Found

FIMA's recent transition from its legacy NFIP system to PIVOT (not an acronym) partly addressed data quality issues. The transition has improved FIMA's ability to timely process policies and claims data, enhance reporting capabilities, and provide more reliable policyholder address validation. These improvements stemmed from FIMA's pressing need to sunset the legacy system as well as from concerted efforts to address lessons learned from prior NFIP modernization failures. Although still in the deployment stage, PIVOT has increased customer satisfaction, improved tracking of properties, and led to better informed NFIP management.

Despite these improvements, the transition to PIVOT has not resolved longstanding data reliability issues, as FIMA migrated the vast majority of its historical legacy data, including errors, into the PIVOT system. FIMA also deployed PIVOT without adequate controls to prevent potentially erroneous transactions from being recorded in the system. These issues remained unresolved because FIMA prioritized system modernization over time-consuming efforts to fix historical data errors. FIMA also transitioned to the new system before supporting vendor systems were ready to process all data changes. This may have hindered NFIP operations, given the high potential error rate during the initial months of PIVOT operation.

Prompt action to resolve these challenges will help FIMA improve data integrity and facilitate more informed management, thereby enabling NFIP stakeholders to more accurately track flood-affected properties and set flood insurance premiums.

DHS Response

FEMA concurred with all three recommendations. See Appendix B for the agency's response in its entirety.

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Appendixes

Abbreviations

C.F.R.	Code of Federal Regulations
DSA	Direct Servicing Agent
FEMA	Federal Emergency Management Agency
FIMA	Federal Insurance and Mitigation Administration
GAO	Government Accountability Office
NextGen	Next Generation Flood Insurance Management System
NFIP	National Flood Insurance Program
OIG	Office of Inspector General
PUP	PIVOT Use Procedures
SRL	Severe Repetitive Loss
U.S.C.	United States Code
USPS	United States Postal Service
WYO	Write Your Own

Background

The National Flood Insurance Program (NFIP) was established by the *National Flood Insurance Act of 1968*.[1] NFIP aims to reduce the impact of flooding by providing affordable insurance to property owners, renters, and businesses. It also requires communities to adopt and enforce flood plain management regulations to be eligible for this insurance. At the time of the original NFIP statute, Congress had determined that post-disaster flood losses (and subsequent Federal relief assistance required to help communities recover from those losses) were becoming increasingly burdensome on the Nation's resources. Through the statute, Congress stipulated that a unified flood insurance program run jointly by the Federal Government and the private insurance industry could promote public interest by providing appropriate protection against flood losses. The collaboration could also encourage sound land use through the mitigation of property exposure to flood events.

Within the Department of Homeland Security, the Federal Emergency Management Agency (FEMA) coordinates Federal Government activities to prepare for, prevent, respond to, and recover from domestic disasters, whether natural or man-made.[2] Specifically, FEMA's Federal Insurance and Mitigation Administration (FIMA) manages the NFIP program. It also manages a range of programs designed to reduce future losses to homes, businesses, schools, public buildings, and critical facilities due to floods, earthquakes, tornadoes, and other natural disasters.

FIMA relies on the Direct Servicing Agent (DSA), FIMA's own insurance contractors, as well as private insurers in the Write Your Own (WYO) program to handle the bulk of NFIP's day-to-day operations. This approach is based on direct interaction between insured individuals and insurance carriers. In other words, DSA and the WYO program run their own flood insurance marketing and sales operations, collect premiums, and make claims payments to the insured. Insurance companies in the WYO program, in turn, typically use one of six vendors to submit policy and claims data to FIMA for inclusion in NFIP's system of record.[3] Although flood insurance policies are managed by DSA and the WYO program, FIMA retains the actual financial risk of NFIP. Flood claims

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[1] On December 20, 2019, the President signed legislation passed by Congress that extends the NFIP's authorization to September 30, 2020.

[2] FEMA's authority is derived from the *Disaster Relief Act of 1974*, as amended by the *Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988* (Public Laws 93–288 and 100–707).

[3] Certain insurers act as their own vendors and submit the required information to FIMA directly.

are paid out of premiums collected by insurance providers, and any payments made beyond the collected premiums are subsidized by FIMA.[4]

Previous to fiscal year 2020, FIMA managed NFIP using a legacy system known as the NFIP Information Technology Systems and Services. This legacy system was developed more than 30 years ago and has evolved over time into a complex network of numerous subsystems and technology services added and aggregated to perform distinct functions. By 2019, when it was retired, the legacy system included nearly 20 mainframe batch systems and subsystems as well as 30 other local area network systems. Although this group of systems was not fully integrated, the systems were interoperable, to some degree, in order to maintain and update NFIP data.[5]

Despite its longevity, the legacy system did not adequately meet FIMA's needs for administering NFIP. The Government Accountability Office's (GAO) *Standards for Internal Control in the Federal Government* require that an agency's management ensure that system transactions are recorded timely and accurately, and that management uses quality information to achieve agency objectives.[6] In this context, quality information is defined as data that are appropriate, current, complete, accurate, accessible, and provided timely. However, FIMA could not count on NFIP for reliable information to prepare for, respond to, and manage flood-related disasters. The legacy system was plagued by significant data-related problems and weaknesses, including a lengthy data submission and validation process, limited reporting capabilities, and data that were erroneous and unreliable. In addition, the lack of real-time access to NFIP data meant that policyholders, WYOs, and vendors could not see and validate the accuracy of their own information recorded in the NFIP system.

Legacy Data Submission and Validation

The efficient and accurate management of NFIP depends on FIMA's ability to receive and validate flood insurance transaction[7] data from vendors and WYOs in a timely fashion. However, the data submission and validation process for

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[4] The arrangement between the NFIP and private industry is authorized by statute and guided by regulation. *See* primarily 42 (United States Code) U.S.C. section 4081, and 44 Code of Federal Regulations (C.F.R.) Part 62.

[5] NFIP data include tables of policy information, claims information, community boundaries, and financial transactions.

[6] *Standards for Internal Control in the Federal Government,* GAO-14-704G, September 2014, Sections 10.03 and 13.01.

[7] A transaction, in this context, refers to any action taken on policy or claim information submitted to the NFIP system of record. Some examples include creating a new policy, updating or adding information to a policy, creating a claim on a policy, and closing out a claim.

the legacy system was especially problematic as a typical policy or claim transaction took 45 to 60 days to process. The following illustrates how a typical policy transaction flowed through the NFIP legacy system:

1. Throughout the monthly processing cycle, DSA and WYOs issued new flood insurance policies based on their interpretations of NFIP rules and regulations. These policy transactions remained in WYOs' (or their servicing vendors') systems until the end of the monthly cycle.

2. At the end of the cycle, the vendors servicing DSA/WYOs sent these new policy transactions in batches to the legacy system for validation.

3. DSA/WYOs and vendors then waited 45 to 60 days for the legacy system to validate the batch transactions.

4. FIMA's contractor manually acquired and reconciled the transaction files and then initiated the automated validation process in which each transaction in the batch was passed through the hundreds of NFIP validation criteria[8] and recorded in the legacy system. Transactions that did not successfully pass criteria were reported back to DSA/WYOs and vendors.

5. Finally, DSA/WYOs and vendors researched the rejected transactions, corrected errors as necessary, and re-submitted the transactions to the NFIP legacy system. However, if the vendors or WYOs determined that a rejected transaction was due to an issue within the NFIP system, they could dispute the rejection. In those cases, the transaction could take additional days or months to resolve.

The time lag between a vendor submitting transactions and receiving a list of rejects was problematic for both FIMA and the submitting vendors/WYOs. For example, a WYO could sell a policy, but typically not know for more than a month whether the property insured by the policy truly qualified for the program. In addition, DSA, WYOs, vendors, and FIMA staff spent hours each month manually reconciling financial data to submitted policy and claims data.

Legacy Reporting Capability

FIMA's NFIP reporting capability was limited by the legacy system's lag in data processing and its inability to create customizable reports. Due to the long lead time to validate a policy or claim transaction in the legacy system, FIMA was not able to query an accurate count of active policies or claims at any given time. This was especially problematic during times of major flooding as the NFIP team could not rely on its own system to assess the potential

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[8] Validation criteria covered numerous areas including proper flood zone, proper policy amount, and proper policy effective date, among others.

magnitude of the flood in real time. For example, during the 2011 Mississippi floods, FIMA had to continually poll its WYO insurance companies via telephone to determine NFIP's claims exposure to the event.

Additionally, the vast majority of reports available under the legacy system were hard-coded, static reports that could only be run as originally designed. The legacy system did not have ad hoc reporting capabilities to produce customizable queries for authorized NFIP stakeholders. Instead, if a stakeholder wanted to modify a report by adding one additional data element, the stakeholder had to contact a system administrator to create a completely new report. Conversely, if a stakeholder wanted to see all claims for a specific WYO over a 6-month period of time, the stakeholder had to either request a new report or run an existing WYO claims report six times (one for each month).

Erroneous Data in Legacy System

The legacy NFIP system was unable to adequately detect, validate, and correct erroneous addresses that were entered. This made it difficult for FIMA to check for duplicate policies that may have been submitted, or to identify claims that were not associated with the correct policies. Inaccurate or improperly validated addresses in the system could potentially lead to policyholders receiving repetitive loss notifications for claims they did not submit and erroneously being charged higher premium rates as a result.

The system also did not adequately perform field-level validation of WYO and vendor data submissions. For example, the legacy system would allow improper data types (e.g., dates in non-date data fields) in the system. It also had a number of other anomalies and basic data integrity issues, including duplicate records, missing data, and invalid entries (such as infeasible dates and values).

Prior NFIP Modernization Efforts

FIMA has initiated at least two major efforts to modernize NFIP's legacy system during the past 30 years. The first effort, in the mid-1990s, was an attempt to migrate the system's applications and data to an updated hardware and software infrastructure. This effort was canceled in the late 1990s, in part, because system users were not sufficiently involved in the design process and project management capabilities were inadequate.[9] The second effort began in 2002, when FIMA initiated development of the Next Generation Flood Insurance Management System (NextGen) to modernize NFIP. After 7 years

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[9] *Action Needed to Improve Administration of the National Flood Insurance Program,* GAO-11-297, June 9, 2011.

and $40 million, FIMA canceled the effort in November 2009 because it failed to meet user expectations. GAO reported that NextGen's failure and cancellation were attributable to a number of acquisition management weaknesses.[10] Specifically, business and functional requirements were not sufficiently defined; system users did not actively participate in determining the requirements for the development of system prototypes or in pilot testing activities; test planning and project risks were not adequately managed; and project management office staffing was limited.

NFIP 2019 Migration to PIVOT

On October 1, 2019, FIMA formally migrated from its legacy system to a modernized system, PIVOT (not an acronym). On this date, PIVOT became NFIP's new official System of Record. PIVOT was launched after more than 6 years of planning and development as a "Level 2" investment in DHS' Acquisition Program,[11] with an original estimated total lifecycle cost of about $744 million over 25 years (2012 to 2038). As of October 24, 2019, FIMA revised the total lifecycle cost downward to approximately $660 million.

By transitioning to PIVOT, FIMA aims to improve a number of NFIP capabilities. These include the ability to process insurance transactions on a near real-time basis, the automation of standard NFIP processes, an expanded functionality to upload supporting documents, and enhanced reporting and data analytics. FIMA developed PIVOT using an agile development approach,[12] and is deploying various features and functionality of the modernized system on a rolling basis. At the time of its launch, PIVOT had met a number of functional criteria, most notably an improved processing time of policy and claims data. FIMA plans to deploy all remaining system features and requirements and achieve PIVOT's full operational capability by the end of FY 2020. These remaining features include further automation of NFIP business processes (such as the claims appeal process) and increased integration between PIVOT and other FEMA systems, including the National Emergency Management Information System, Integrated Financial Management Information System, and Grants Management Modernization. In February 2020, FIMA officials stated they had fully decommissioned the legacy system.

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[10] *Action Needed to Improve Administration of the National Flood Insurance Program,* GAO-11-297, June 9, 2011.

[11] A Level 2 acquisition in DHS' Acquisition Management Program is defined as a major program with a lifecycle cost estimate between $300 million and $1 billion.

[12] Agile development emphasizes inspecting and adapting, rather than following a set plan. Teams develop functional products incrementally through small, frequent updates, rather than relying on a single, massive deployment. The goal of agile development is to deliver prioritized capabilities to users more quickly than traditional system development methods.

Prior Audit Reports on NFIP

GAO has issued numerous reports during the past 10 years that identified longstanding challenges related to NFIP modernization and data quality. Similarly, the DHS Office of Inspector General (OIG) has identified NFIP data challenges.

- In June 2011, GAO reported that FEMA was facing significant management challenges in areas that affect NFIP, including modernization. GAO cited numerous management errors that led FEMA to cancel the modernization program in 2009, after 7 years and $40 million.[13]

- In February 2013, in its high-risk series, GAO reiterated challenges in acquisition practices that led to the failed modernization effort discussed in the June 2011 report. GAO acknowledged that FEMA had begun implementing some changes to its acquisition management practices, but it remained to be seen whether FEMA would avoid problems that led to previous modernization failures.[14]

- In December 2014, GAO reported that FEMA was unable to calculate foregone premiums — the difference between subsidized and full-risk premiums — because it did not collect flood risk information for all policies. GAO recommended that FEMA develop a plan to collect this information.[15]

- In December 2016, GAO reported that FEMA had not revised its compensation practices for WYO companies to reflect actual expenses as required by the *Biggert-Waters Flood Insurance Reform Act of 2012.* GAO found the failure to reflect actual expenses was partly due to a lack of quality expense data.[16]

- In September 2017, DHS OIG reported that FEMA was unable to assess flood hazard miles to meet its program goal and was not ensuring mapping partner quality reviews were completed in accordance with

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[13] *Action Needed to Improve Administration of the National Flood Insurance Program,* GAO-11-297, June 9, 2011.
[14] *High Risk Series: An Update,* GAO-13-283, February 2013.
[15] *Flood Insurance: Forgone Premiums Cannot Be Measured and FEMA Should Validate and Monitor Data System Changes*, GAO-15-111, December 11, 2014.
[16] *Flood Insurance: FEMA Needs to Address Data Quality and Consider Company Characteristics When Revising its Compensation Methodology*, GAO-17-36, December 2016.

applicable guidance.[17]   Flood map data provide risk information and create the foundation for floodplain management, flood insurance, and mitigation. Therefore, a lack of such data impedes FEMA's ability to provide the public with a reliable rendering of true flood vulnerability or ensure that NFIP rates reflect the real flooding risk.

- In March 2019, GAO once again included NFIP in its high-risk series.[18] GAO identified a number of actions to be taken, including completing efforts to establish a new information technology system for NFIP.

Results of Audit

FIMA's recent transition from its legacy NFIP system to PIVOT partly addressed data quality issues. The transition has improved FIMA's ability to timely process policies and claims data, enhance reporting capabilities, and provide more reliable policyholder address validation. These improvements stemmed from FIMA's pressing need to sunset the legacy system as well as from concerted efforts to address lessons learned from prior NFIP modernization failures. Although still in the deployment stage, PIVOT has increased customer satisfaction, improved tracking of properties, and led to better informed NFIP management.

Despite these improvements, the transition to PIVOT has not resolved longstanding data reliability issues, as FIMA migrated the vast majority of its historical legacy data, including errors, into the PIVOT system. FIMA also deployed PIVOT without adequate controls to prevent potentially erroneous transactions from being recorded in the system. These issues remained unresolved because FIMA prioritized system modernization over time-consuming efforts to fix historical data errors. FIMA also transitioned to the new system before supporting vendor systems were ready to process all data changes. This may have hindered NFIP operations, given the high potential error rate during the initial months of PIVOT operation.

Prompt action to resolve these challenges will help FIMA improve data integrity and facilitate more informed management, thereby enabling NFIP stakeholders to more accurately track flood-affected properties and set flood insurance premiums.

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[17] *FEMA Needs to Improve Management of Its Flood Mapping Programs*, OIG-17-110, September 27, 2017.
[18] *High Risk Series: Substantial Efforts Needed to Achieve Greater Progress on High-Risk Areas*, GAO-19-157SP, March 2019.

NFIP's System Modernization Increased Availability of Real-Time Data

FIMA's migration to PIVOT has led to shorter processing times, increased reporting capabilities, and more sophisticated functionality to validate policyholder addresses entered by system users. FIMA officials attributed these improvements to the pressing need to replace the costly legacy system, which did not provide adequate data for program management. They also pointed to the application of valuable lessons learned — including increased project oversight and allocation of additional resources — from previous failed NFIP modernization attempts as contributors to success. As a result of the improved PIVOT functionality, FIMA officials and WYO vendors reported increased customer satisfaction, more reliable tracking of properties, and better informed NFIP management.

Improved NFIP Processing Times, Reporting Capabilities, and Address Validation

Three of the data-related deficiencies with the legacy system that FIMA planned to address through the NFIP modernization effort were data processing lags, limited reporting, and insufficient address validation. Since transitioning to PIVOT in October 2019, FIMA has provided system users with faster processing times for policy and claims transactions, enhanced reporting capabilities, and improved policyholder address validation.

Improved Transaction Processing Time

The transition from the legacy system to PIVOT enabled FIMA to process NFIP policy and claim transactions in near real-time, as compared to the 45 to 60 day processing cycle under the legacy system. Using the new PIVOT interface,[19] vendors are now able to submit their policy and claim transactions at least once every business day, rather than waiting until the end of a monthly cycle to submit transactions in a large batch. Once submitted, a transaction immediately activates the PIVOT validation process. Transactions that meet validation criteria are recorded in PIVOT, whereas transactions that do not meet the criteria are automatically rejected and returned to the vendors for correction. The vendors we interviewed reported that this turnaround time typically takes less than 1 day from data submission. Some vendors even said they experienced nearly-instantaneous data verification, indicating they received results almost as soon as they submitted the transactions.

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[19] Vendors submit transactions to PIVOT using various Application Programming Interfaces associated with the different transaction types. Some vendors transmit their data on a rolling basis, immediately upon receipt from the WYOs. Others submit data at specific intervals throughout the day, or once a day at a specific time.

The new PIVOT data verification process is designed to identify and reject transactions with field-level errors (e.g., dates submitted in non-date fields and policy numbers submitted in an improper format) or other specific data integrity violations, such as claim openings on non-existent policies and policy reinstatements without previous cancellations. According to FIMA's contractor responsible for building the PIVOT system, these basic data quality checks did not exist in the legacy system. Vendors said they were generally satisfied with NFIP's new ability to provide them with immediate confirmation of submitted transactions. The vendors were nearly unanimous in citing near real-time processing and validation as key successes of the modernization effort.

Improved Reporting Capability

FIMA implemented new reporting capabilities to provide authorized PIVOT users with the ability to download and customize a number of reports. The new reporting capabilities are built on a custom web-based platform and use Tableau visualization software for the creation of flexible, customizable reports with up-to-date data. For example, users now have the ability to report the number of flood insurance policies written and the status of claims in a particular state at any given time. Using PIVOT, FIMA management can also produce dashboards and visualizations that present all claims from various disasters in a particular time period. In one instance, FIMA officials noted that their office was able to immediately provide the new FEMA Administrator with the number of claims submitted on a particular day, rather than having to wait for multiple days to obtain that information.

PIVOT also has the ability to issue "WYO report cards," which can be used to benchmark the performance of individual WYOs against their competitors in a number of different performance areas. FIMA personnel stated that this functionality has been very helpful in providing them with on-demand, early indications as to which WYOs are having difficulties during the transition. It is also expected to help streamline the WYO performance review and feedback process.

Improved Address Validation

PIVOT was designed to enable property address validation and correction for policy and claims data. Although the legacy system did include some address validation capabilities, they were not comprehensive enough to be effective. Consequently, DSA/WYOs and vendors could not be assured that the addresses they entered into the legacy system were valid. Then, if a claim was filed referencing an incorrect address, FIMA had to work with the WYO or

vendor to manually reassign the claim information to the correct property address.

PIVOT mitigates these issues through an automatic address validation process that takes place immediately upon transaction submission. When a vendor or WYO submits new policy data, the property addresses associated with those policies are run through the United States Postal Services' (USPS) address validation system before being recorded in PIVOT. Additionally, these addresses are geocoded[20] using the CoreLogic system, and the properties' latitude and longitude coordinates are recorded in PIVOT. Furthermore, during the migration of historical NFIP data from the legacy system to PIVOT, FIMA personnel stated that they ran the addresses of all active policies through their address validation and geocoding processes to ensure that property information can be reliably tracked over time.

Our analysis of NFIP data confirmed that, as of December 2019, nearly all active policies in PIVOT had been populated with at least two address fields. The first field of each policy contained the address as entered by the vendor, whereas the second field contained the USPS-validated address. Additionally, using the vendor-entered address field, we independently geocoded more than 4 million active policies in PIVOT. We were able to confirm that more than 99 percent of all active policies had PIVOT-generated geocodes that substantially matched with our independently calculated coordinates.
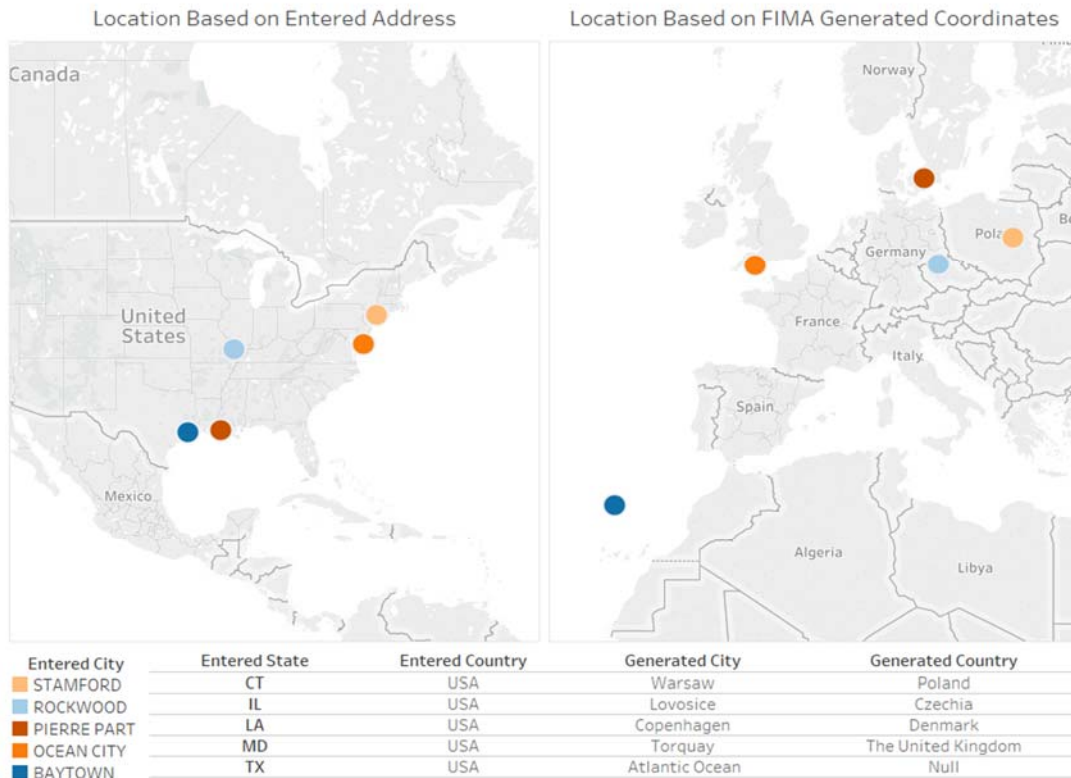
Although our analysis confirmed that nearly all active policies matched address coordinates, it should be noted that our statistical sampling test projected that more than 28,000 policies may have substantial errors in their geocoded coordinates. As shown in Figure 1, some of these errors mapped properties in countries that were completely different from their entered addresses.

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[20] Geocoding is the process of converting addresses (e.g., a street address) into geographic coordinates (e.g., latitude and longitude), which can be used to place markers on a map, or position the map.

Figure 1. Examples of PIVOT Policy Data for Which the Vendor-Entered Property Addresses Did Not Match FIMA-Generated Property Coordinates

Entered City	Entered State	Entered Country	Generated City	Generated Country
STAMFORD	CT	USA	Warsaw	Poland
ROCKWOOD	IL	USA	Lovosice	Czechia
PIERRE PART	LA	USA	Copenhagen	Denmark
OCEAN CITY	MD	USA	Torquay	The United Kingdom
BAYTOWN	TX	USA	Atlantic Ocean	Null

Source: OIG-generated based on NFIP data as of December 18, 2019

Factors Contributing to NFIP Modernization Progress

FIMA officials credited the successful system implementation to a pressing need to improve NFIP administration and reduce maintenance costs by retiring the legacy system. FIMA management also had taken steps to increase the likelihood of success by applying lessons learned regarding NFIP program management, oversight, and resource allocation from previous modernization failures.

Legacy System Hindered Useful and Cost-Effective NFIP Administration

The legacy system had failed to deliver quality information necessary for the most basic NFIP management tasks. According to FIMA officials, this was the primary factor uniting the organization behind the goal of achieving a successful PIVOT launch. FIMA documents also referenced prior GAO reports describing the legacy NFIP system as "ineffective and inefficient" when discussing the need to modernize. FIMA noted that legacy system weaknesses

identified by GAO, such as inadequate internal controls, unreliable data, and poor records, financial, and acquisition management, had spurred necessary investment in a new, more effective NFIP system.

Furthermore, FIMA officials stated that the legacy system was extremely costly to maintain. FIMA incurred roughly $1 million per month just to host the legacy system, along with an additional $1.3 million per month in maintenance costs. This, in addition to operating costs, translated to a yearly cost of approximately $46 million for a system that was not meeting FIMA's needs. By modernizing to PIVOT, FIMA officials estimated they would save roughly $22 million a year. FIMA officials said the need to deliver a cost-saving system that could provide useful management data became an important driver for the PIVOT project management office.

<u>Application of Lessons Learned Contributed to Modernization Success</u>

Lessons learned from prior NFIP modernization efforts drove FIMA to increase its focus on program management, oversight, and resource allocation. To address historic program management deficiencies, FIMA officials outlined business requirements during the planning stages of PIVOT development from FY 2013 to 2017. For example, FIMA created formal documentation, including a Concept of Operations and an Operational Requirements Document, which described a number of high-level capability gaps in the legacy system. FIMA then translated the high-level goals and requirements into a list of specific functional requirements tracked throughout the modernization process. Completion of these steps during PIVOT development were in accordance with milestone development actions prescribed in DHS acquisition guidance for Level 2 investments.[21] Furthermore, FIMA's requirements development process for PIVOT included more than 70 interviews, meetings, and focus group sessions with a range of NFIP stakeholder groups.[22]

According to FIMA officials, failed oversight of the NextGen modernization attempt had been a major lesson learned. Neither the FEMA review board nor DHS executive offices provided effective, executive-level oversight of the 2002 NextGen initiative. To improve oversight during PIVOT system development, FIMA obtained review and concurrence from multiple stakeholders and oversight bodies. Specifically, planning and acquisition milestone documents for the modernization, such as the Mission Needs Statement, Capability Development Plan, Concept of Operations, and Analysis of Alternatives, were each signed by multiple parties responsible for oversight. These included the FEMA Component Acquisition Executive, the FEMA Chief Information Officer,

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[21] *DHS Instruction 102-01-001, Rev 01, Acquisition Management Instruction*, March 9, 2016.
[22] NFIP stakeholders include personnel from across FEMA, as well as WYO insurance companies, vendors, insurance agents, adjusters, and mortgage lenders.

and the DHS Joint Requirements Council. Following initial review and approval of these requirements, FIMA's PIVOT development efforts were monitored in accordance with the DHS acquisition lifecycle framework. This included bi-annual FIMA presentations to the DHS Acquisitions Review Board, detailing the progress of modernization activities.

Additionally, FIMA increased its staffing and resource allocation to support the PIVOT project. To illustrate, the NextGen effort had only one full-time government employee, the Contracting Officer's Technical Representative, assigned from 2006 until the project's cancellation. However, for the modernization to PIVOT, FIMA stood up an entire team devoted to the project. This team, consisting of more than 15 full-time employees and contractors, included staff responsible for project management, system engineering, and testing and evaluation.

PIVOT Deployment Has Resulted in More Effective NFIP Administration

Though deployment is still ongoing, preliminary reports from FIMA personnel and vendors have indicated that the transition to PIVOT has led to increased customer satisfaction in some areas, more reliable tracking of properties, and better informed NFIP management.

Vendors we spoke with were nearly unanimous in commending the improvements in customer satisfaction. For example, rather than telling their WYOs and policyholders to wait 60 days or more for new policy or renewal validations, they can now relay responses almost immediately. In addition to providing peace of mind to customers, the system improvement allows policyholders and WYOs to quickly respond to denials or requests for additional information. This is in contrast to legacy system operations, in which policyholders and WYOs did not know whether a policy had been declared invalid until weeks after it was initially submitted. According to some vendors, the PIVOT processing cycle also brings NFIP into greater alignment with timing in the insurance market, such that policies become effective almost immediately after they are written and the first premiums are paid. PIVOT processing also reduces the likelihood of FIMA denying a claim that a policyholder believes has already been approved.

Enhancement of PIVOT's address validation methodology has enabled more reliable tracking of NFIP properties. FIMA has been able to improve its rate setting processes for these properties and its ability to track property information (such as the number of associated claims) over time. For example, FIMA officials stated they now can quickly and accurately identify properties that incurred repetitive losses in the past, which helps them assign proper premium pricing.

FIMA officials have seen early improvements in NFIP administration through PIVOT's new, customized, and up-to-date reporting. FIMA management can now instantaneously provide an accurate count of new policies and claims related to any flood event on demand. Rather than expending tremendous organizational effort to manually contact WYOs and vendors to obtain data, FIMA officials can now focus their efforts on other high-value tasks such as conducting damage assessments, supporting disaster declarations, and assessing risks of flood events. FIMA is also able to use PIVOT's new performance reports to identify low performing vendors and WYOs and institute remedial training as needed. FIMA officials were optimistic they will soon be able to leverage the PIVOT reporting tool to develop data modeling capabilities that will improve resource allocation and disaster response time.

Data Quality Issues Still Exist in the Modernized NFIP System

Despite these improvements, the overall success of the PIVOT system implementation is yet to be determined. Although FIMA has made substantial progress in processing time, the transition to PIVOT did not resolve existing data reliability issues, in part, because FIMA migrated its historical NFIP data from the legacy system "as-is," including data errors. FIMA also deployed PIVOT without controls in place to prevent potentially erroneous transactions — flagged as warnings — from being recorded in PIVOT. FIMA officials stated that these issues remained unresolved because, given limited resources, they prioritized modernization of system functionality rather than expending time to correct historical data errors. FIMA also transitioned to PIVOT before the WYO vendors were ready to process all data quality changes in their own systems. Consequently, NFIP's day-to-day operations could be hindered, as some vendors reported transaction error rates of more than 50 percent during the first 4 months of PIVOT implementation. We similarly identified errors in FY 2020 PIVOT data that may impact the accuracy of NFIP policy and claim transactions.

Modernized NFIP System Contains Known Data Errors

Recent legislation and Federal guidelines emphasize the importance of using reliable data for policymaking and program operations. For example, the *Foundations for Evidence-Based Policymaking Act of 2018* emphasizes the importance of ensuring that statistical activities conducted by Federal agencies are "objective."[23] Objective, in this context, means that data and analyses must be accurate, clear, complete, and unbiased. Additionally, GAO's *Standards for Internal Controls in the Federal Government* require that agency

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[23] 44 U.S.C. § 3563.

management design appropriate control activities over information processing to ensure that all transactions are complete and reliably recorded.[24] Similarly, DHS' *Data Quality Guide* emphasizes the importance of data quality as crucial to decisions affecting national security, lives, property, and quality of life."[25]

Despite the importance of data reliability, several issues regarding the completeness and accuracy of NFIP data persisted in the PIVOT system.

<u>Historical Errors in NFIP Data Were Included in Data Migration to PIVOT</u>

With limited exceptions, errors identified in the historical NFIP data were not addressed as part of the migration from the legacy system to PIVOT. The presence of historical errors was publicized in March 2017, when FIMA released a Data Quality Discovery and Profile Findings Report, after its data quality and analytics team analyzed NFIP data tables in the legacy system for accuracy, completeness, and anomalies. This internal analysis revealed instances of corrupted data tables, duplicative records, and invalid entries in the legacy system. One notable finding was that 65 of 152 (nearly 43 percent) tables analyzed contained some form of data issue. Additionally, the study found that 8.4 percent of all policy data analyzed were deemed invalid, and 13.2 percent contained cross-field validation errors (i.e., errors in interrelationships between data fields across tables).

Despite the issues noted in 2017, FIMA did not take adequate steps to correct them before migrating from its legacy system to PIVOT. FIMA officials acknowledged they migrated to PIVOT without addressing data quality issues in a comprehensive fashion. Although FIMA took some steps, such as subjecting addresses of active policies to USPS validation and geocoding, officials reported no intention to go back and fix historical records in a systematic fashion.

Our own analyses of historical NFIP data in PIVOT confirmed that a number of data quality issues were not addressed during the migration. For example, historical data moved into PIVOT still contained:

- dates outside of feasible ranges (e.g., policy in force dates of 1753 or 2097),
- data fields missing required values (e.g., property elevation information), and

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[24] *Standards for Internal Control in the Federal Government*, GAO-14-704G, September, 2014, Section 10.03.
[25] DHS Enterprise Data Management Office, *Department of Homeland Security Data Quality Guide, Version 2.0*, dated February 18, 2019.

- information that had not been validated (e.g., policy cancellation dates without cancellation reasons).

Additionally, FIMA was not collecting all relevant data necessary for the accurate validation of all flood insurance premium rates. For example, in October 2018, NFIP extended the eligibility of some insurance applicants for a special rate based on properties in newly mapped flood zones. Individuals are now eligible for the special newly mapped rate if they submit applications within 12 months of the flood map revision date or within 45 days of the initial lender notification (provided this occurred within 24 months of the map revision date). However, our analysis showed that PIVOT did not capture the date of lender notification used to determine eligibility. Because of this, FIMA cannot properly validate an applicant's eligibility for this special rate and may be charging inaccurate premiums for policies in newly mapped flood zones.

Data Quality Issues in Newly Submitted Transactions

Prior to PIVOT, policy and claim transactions submitted to the legacy system were subject to a series of validation checks designed to identify potentially ineligible or erroneous submissions. Such submissions included policies issued for properties that did not qualify for NFIP due to business rule violations, such as multiple policies issued with the same policy number and claims or renewals submitted for policies that did not exist in the system. Transactions that did not pass all edit checks were returned to vendors and WYOs for resolution and resubmission at the end of each processing cycle.

However, FIMA did not enforce similar edit check functionality in PIVOT. Rather, FIMA intentionally deployed PIVOT in a "permissive mode," which separates edit errors into two distinct categories: "Rejections" and "Warnings." Rejections occur when a submission contains a field-level error or other data integrity issue (such as a claim without an existing policy) preventing the transaction from being physically saved in the system. By design, vendors must correct and re-submit rejected errors in order for them to be accepted into PIVOT. Warnings, on the other hand, are transactions that PIVOT flags as inaccurate or failing to meet NFIP business rules but are still allowed into the system. Warnings generate messages notifying vendors of potential problems with a transaction. However, vendors are not required to correct the entries before they are recorded in PIVOT.

FIMA officials stated that the primary purpose of permissive mode was to alleviate pressure on vendors during the transition from the legacy system to PIVOT. Permissive mode provided vendors additional time to adjust to the modernization, resolve internal system issues, and "catch up" with PIVOT before requiring that all data submission issues be fixed. FIMA intended

permissive mode to be a temporary solution and originally slated it to run for just 1 month after PIVOT became the system of record, through October 31, 2019. As of February 2020, however, the use of permissive mode had been extended to continue easing the shock of the system transition on the vendors, with a targeted turn-off date of April 30, 2020. As of May 2020, FIMA had extended permissive mode in PIVOT indefinitely.

Operating in permissive mode increases the risk of populating NFIP's official system of record with additional data errors. One major NFIP vendor indicated more than 250,000 policy and claim transactions they submitted to PIVOT from October 2019 through January 2020 resulted in warnings. This translated to roughly 53 percent of their total transactions during that time period. Another vendor reported single-day warning rates as high as 57 percent as recently as February 2020, 4 months after PIVOT went online. These warning rates indicate that, because of permissive mode, PIVOT was accepting a significant number of transactions its own validation criteria deemed to be problematic. FIMA officials acknowledged that operating in permissive mode resulted in poor data quality in the new NFIP system of record. Although troubled by it, FIMA officials said that data quality issues were still less severe in comparison to the legacy system, and the benefits of the new system outweighed the costs of bad data.

Our own analyses of claims and policy data confirmed the presence of erroneous data in PIVOT. For example, we determined that 42 of the 2,650 claim transactions accepted by PIVOT from October 1, 2019 through December 18, 2019, had dates of loss that occurred after the dates the claims were closed. Additionally, 267 claims had payment transactions that were dated after the claims were closed. Because an insurance claim cannot be finalized before a loss takes place, and payments should not be made after claims have been closed, these types of data errors should not have been allowed to occur. Table 1 lists additional examples of data errors allowed in PIVOT through permissive mode.

Table 1. Descriptions and Counts of Data Errors Accepted in PIVOT through Permissive Mode, October 1 – December 18, 2019

Issue	Description	Count
Invalid Addresses	Policy transactions were associated with addresses that did not pass USPS validation checks.	6,394
Invalid Map Panel Information	The map panel field for policy transactions was not populated. This field is necessary to determine a property's flood region and thus the proper rate and coverage eligibility for its associated policy.	7,207
Missing Elevation Certificates	Data fields indicating the presence of an elevation certificate were not populated. Elevation certificates are necessary to validate policy eligibility for special rates based on locations in Special Flood Hazard areas.	207
Invalid Community Information	The community field for policy transactions was not populated. This field is necessary to determine a policy's NFIP eligibility and ensure the proper rate and discount is applied to the policy.	821

Source: DHS OIG analysis of NFIP PIVOT data

In addition to the examples we identified, vendors reported a number of other specific data errors allowed to be recorded in PIVOT because of permissive mode. These included policy transactions for which the total calculated premium amounts could not be validated; claim transactions with payment amounts that exceeded the proper limit or that contained invalid damage amounts; and policy transactions for which PIVOT could not validate the application of discounts (such as so-called "grandfathering" rules that entitle some properties to subsidized premium rates). Allowing such errors in PIVOT results in an unacceptably high number of data quality issues in a system that should be accurate and reliable for program management and reporting.

Further, vendors we interviewed stated that correcting transactions rejected in PIVOT was a time-consuming process. Specifically, upon receiving notice of a rejected transaction, a vendor must research the reason for the rejection. If the error is on the vendor's end, the vendor must correct the error and resubmit the transaction within 3 days of rejection notification. If the vendor believes the rejection is a result of an issue with the PIVOT system itself, the vendor must open an exception request and petition FIMA to re-evaluate the transaction and allow it through.

However, the same could not be said for the transactions PIVOT classified as warnings. Because of the time-consuming nature of the error-correction process, some vendors stated that they did not have the capacity to record, research, and resolve all of the warnings they had been receiving each month.

Many vendors did not even track transactions flagged as warnings, mainly because they were too consumed with researching and addressing transactions classified as rejections. Nonetheless, FIMA officials said they expected vendors to eventually correct the errors associated with warnings that had occurred since the start of FY 2020.

All vendors we interviewed expressed tremendous concern about what may happen when FIMA turns off permissive mode, thereby no longer separating transaction errors into rejections and warnings. Transactions now classified as warnings would become flat-out rejections. The time-consuming nature of the error correction process would cause vendors to miss the 3-day deadline to address the errors — that is, if they had the capacity to do so. Ultimately, vendors foresaw that their business processes and customer satisfaction would suffer if permissive mode is turned off too soon. Vendors urged that permissive mode should not be removed until they have ample opportunity to reduce the number of warnings that PIVOT generates to a minimally acceptable number.

Factors Contributing to Data Quality Issues in the Modernized NFIP System

FIMA officials stated that data quality issues remained unresolved in PIVOT due to limited resources. They said they prioritized modernization of system functionality above time-consuming efforts to correct historical data errors. FIMA also transitioned to the new system before vendor systems were ready to process all data changes.

<u>FIMA Lacked Resources to Address Errors in Historical Data</u>

FIMA made a conscious decision to focus on deploying the modernized system's functionalities, rather than expending resources to fix historical data in PIVOT. FIMA officials explained they lacked the requisite resources to both stand up the new PIVOT system and comprehensively address historical data issues at the same time. Instead, they elected to accept a certain level of risk in moving the historical data into the modernized system. FIMA officials believed focusing excessively on historical data would have impeded the modernization effort, and they did not think delaying the migration to PIVOT to sufficiently cleanse all of the data would have been worthwhile.

During our audit fieldwork in February 2020, FIMA did not have a plan to comprehensively cleanse and validate the historical NFIP data in PIVOT. Instead, FIMA officials and PIVOT technical personnel stated they were working on a case-by-case basis to address some of the data issues. For example, FIMA intended to submit all historical policy data through its improved address standardization process, recognizing that having reliable address information

for all policies (even those no longer active) was crucial to tracking property losses over time and ensuring sound NFIP management. Additionally, FIMA opted to address historical data issues on a case-by-case basis as they came up in their day-to-day activities. These activities included identifying duplicative policies and determining which are the "correct" ones, as well as adding geographical coordinates to the property addresses in older policies.

FIMA did not plan to comprehensively add all relevant information regarding data fields (such as lender notification dates required for newly-mapped rates) potentially missing from the legacy system. FIMA officials also stated that they did not collect every piece of policy data required by WYO insurance companies and vendors. Rather, they relied on their policy appeals process and operational reviews of WYOs to ensure that rates were implemented correctly.

FIMA officials expressed confidence in the quality of the migrated data for existing policies in force, but acknowledged that the older the data, the more questionable the quality (especially with respect to data submitted more than 10 years ago). Moving forward, FIMA planned to continue to focus on new data submitted to PIVOT, while working incrementally to improve historical data quality as much as their time and resources allowed.

Vendors Were Not Ready for the Transition to PIVOT

FIMA implemented permissive mode and accepted a large number of data submission errors in PIVOT because the vendor systems were not ready to process newly enforced data requirements when NFIP transitioned to the new system of record. PIVOT relies on a completely different program interface and data submission process from the legacy system. Although some vendors had already rebuilt their systems in preparation for this transition, others were still in the process of substantially re-engineering their systems and processes to accommodate the new interface.

FIMA proceeded with the transition to PIVOT on October 1, 2019, even though the vendors did not believe that applicable systems were ready. Prior to the system transition, FIMA sent NFIP vendors a PIVOT Application Checklist for Transition. This document was an acknowledgement for NFIP system users to sign, indicating they were prepared for the transition from the legacy system to PIVOT. FIMA's 2018 PIVOT Test Strategy and Quality Control Plan affirmed that user acceptance was crucial to ensuring that PIVOT meets vendor needs and is able to operate within day-to-day processes and organization. User acceptance testing is a critical stage of the DHS system engineering lifecycle process for all DHS major acquisitions.[26] Despite affirmation of the criticality

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[26] DHS Guidebook, 102-01-103-01, *Systems Engineering Life Cycle Guidebook*, dated April 18, 2016.

of the need for user acceptance, none of the five vendors we interviewed signed off on the checklist for transition.

The vendors we interviewed said they did not sign because they did not believe PIVOT (as well as some of their own systems) was ready to go live on the designated date. In fact, as late as September 2019, mere days before the scheduled transition to PIVOT, FIMA identified 17 new issues that testing had identified that week, in addition to nearly 20 other previously identified issues already being addressed. Because of the many open issues that were not resolved during testing, the vendors expressed concerns about the reliability of data pushed into PIVOT production. One vendor asserted that FIMA was essentially using the production phase of PIVOT as the testing phase, as adequate testing had not been performed prior to the transition. Given the high number of errors they experienced during testing, vendors insisted FIMA should have extended the parallel processing period (e.g., using both systems simultaneously) of PIVOT testing.[27] This would have ensured more time to research major data submission errors, identify root causes, and take steps to modify systems, as necessary.

According to FIMA officials, vendors were not accustomed to receiving immediate feedback on their submissions through real-time validation. As such, they were not adequately prepared to address errors as soon as they arose. FIMA officials explained that adoption of permissive mode in PIVOT was a joint decision between FIMA and the vendors to avoid severe shock to the vendors' business processes (i.e., transitioning from a 2-month process to addressing errors in real time). However, FIMA officials also admitted they were concerned with the quality of the data being allowed into the PIVOT system. Although the officials stated that they were able to track all warnings generated by PIVOT, they had no plan for holding the vendors accountable and ensuring the potentially erroneous data entering the new system would eventually be corrected. FIMA officials continually referred us to the PIVOT user guide and application program interface documentation when asked how they would implement vendor accountability. Although these documents state that all warnings should be reviewed by the vendors and resubmitted, they include no discussion of how this process will be enforced. Some vendors, for their part, said that going back and correcting all warnings in PIVOT at that time simply was not feasible.

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[27] Under parallel processing, FIMA and stakeholders worked in the legacy system and PIVOT simultaneously. Data submission results from each system, inclusive of monthly deliverables, were compared to ensure that PIVOT was operating as expected before it became the NFIP's official system of record.

<u>FIMA Transitioned to PIVOT without Addressing Major Submission Errors
Identified during Testing</u>

Before transitioning to PIVOT, FIMA did not address the presence of major data
submission errors identified during system testing. FIMA's 2017 Test and
Evaluation Master Plan defined the criteria for success and set key
performance measures that needed to be met before PIVOT could progress to
the production phase. However, our review of the Test and Evaluation Master
Plan and other supporting testing documents revealed they did not include
quality and accuracy of data submitted to PIVOT as an evaluative criterion. In
other words, FIMA did not require that data the vendors submitted be relatively
reliable before declaring testing a success.

During the 4-month period of parallel processing from late May 2019 to late
September 2019, vendors submitted nearly 6.6 million transactions to both the
legacy system and PIVOT. FIMA data showed the average error rate for these
transactions ranged from 68 percent to nearly 84 percent across vendor and
transaction type. That means at least 4.4 million transactions submitted
during the 4-month period were flagged as being potentially erroneous. In fact,
some vendors experienced a 100 percent error rate across a range of
submissions such as claim closures, reinstatements of policies with changes,
and changing reserves for claims. Nearly all vendors continued to experience
average error rates around 90 percent for policy endorsements, a major
insurance activity, throughout the parallel processing test period.

The high error rates during this test period were especially concerning because
FIMA reported that it conducted testing on only 27 of the 67 different
application program interfaces (e.g., opening a claim, correcting a policy,
renewing a policy). This means that 40 interfaces were not tested prior to FIMA
transitioning to the new system. The high error rates experienced throughout
parallel processing, coupled with the failure to test 40 interfaces, indicate FIMA
did not adequately take advantage of the opportunity to discover and resolve all
data submission issues prior to the transition. Without resolving these issues
during testing, it is not surprising that vendors continued to experience high
error rates into March 2020, at the end of our fieldwork and 5 months into
PIVOT operations.

The vendors we interviewed expressed frustration with the lack of clarity from
FIMA on the causes of the data submission errors and how to address them.
Vendors indicated that, under the legacy system, they had clear knowledge of
what constituted a successful transaction versus what would produce an error.
This was because user guides for the legacy system documented in detail the
edits applied to vendor-submitted transactions. In contrast, vendors stated,
the recent PIVOT User Guide was overly broad and did not include detailed

explanations of the edits PIVOT applied to assess each transaction submitted. Vendors claimed that FIMA often referred them to the PIVOT Claims and Policies Application Program Interface documentation to interpret what transactions PIVOT would accept. However, some vendors stated this documentation was not detailed enough and did not adequately replace the clear guidelines previously in place for using the legacy system. Consequently, when faced with rejections and warnings from the PIVOT system, some frequently were unsure of how to address those issues without extensive and time-consuming research that often devolved into a series of back-and-forth email communications with FIMA or PIVOT technical personnel.

Overcoming Data Quality Issues Is Critical to Improve NFIP Management

It is essential that NFIP's system of record contain reliable policy and claims data to accurately track flood-affected properties and set flood insurance premiums. However, FIMA's premature transition to PIVOT and the resulting erroneous data in policy and claims transactions call into question FIMA's ability to reliably conduct its flood insurance business.

Planning and system development documentation supporting the NFIP modernization effort consistently stressed the need for the new system to improve FIMA's flood response and decision-making processes by providing dashboards, predictive analytics, and up-to-date forecasts and statistical models. These capabilities were expected to help FIMA address issues identified by both internal and external entities as impediments to keeping NFIP management well-informed. However, the capabilities are only as reliable as the underlying data on which they depend. If the quality of the data the analyses and models extract is poor, then the information FIMA gleans from them is also unreliable. Without ensuring reliable data in PIVOT, FIMA is not equipped to generate usable forecasts, effectively manage business processes, resolve discrepancies, or identify potentially fraudulent claims. To illustrate:

- Forecasting. Duplicative policies could potentially result from permissive mode allowing PIVOT to record policies with invalid addresses and other information. A report based on such invalid data may indicate that NFIP is growing at an inflated rate in certain areas while declining in others. Any forecasts regarding future growth of the program based on that invalid information may also be erroneous.

- Claims reporting. Claims that are closed without payment but erroneously labeled as simply "closed" will skew any financial statistics or reports derived from calculations of the data. Inaccuracies in the number and dollar amounts of claims actually

paid out could have a negative impact on FIMA's financial projections and decisions as well.

- <u>Funding and business operations</u>. If PIVOT does not reject transactions deemed ineligible for certain discounts and premium rates, FIMA may collect payments or pay out claims for which the policyholders do not qualify. This could result in FIMA paying more money than it should or not collecting proper premium amounts.

- <u>Resolving discrepancies</u>. FIMA may be unable to rely on its system of record to resolve potential errors or discrepancies with its vendors and WYOs if PIVOT accepts potentially problematic transactions from them. To ensure accuracy, FIMA would have to provide manual oversight and rely on submitted documentation to address errors — an inefficient and potentially time-consuming process. For example, without recording the vendor notification date needed to set proper premium rates, FIMA would have to search through uploaded policy documents or simply take the vendor's word that a policyholder is qualified.

- <u>Severe repetitive loss (SRL) projections</u>. FIMA relies on historical NFIP data for time-series analyses and projections based on past records. FIMA requires accurate historical information to identify and track properties that consistently take losses and set premiums accordingly. SRL[28] properties are governed by a series of laws and regulations which, if not adhered to, could result in properties not being able to obtain favorable NFIP insurance.

Conclusion

FIMA has made substantial improvements to NFIP through system modernization. However, significant data quality issues still need to be addressed. FIMA's challenges overcoming data quality issues in PIVOT will be exacerbated the longer the system continues to operate in permissive mode. But, turning off permissive mode without first reducing error rates to a manageable level will create a heavy burden on NFIP vendors, which may have adverse ripple effects on NFIP business and customer satisfaction. This

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[28] A SRL designation applies to any NFIP-insured property that has incurred four or more separate claim payments each totaling $5,000 or more (including building and contents payments), or two or more separate claim payments where the total payments exceed the current value of the property.

dilemma could have been avoided had FIMA properly planned for and addressed data submission issues prior to its transition to the PIVOT system.

Resolving the data quality issues will increase FIMA's ability to address past weaknesses, bolster confidence in business processes using the new system of record, and improve management of the NFIP program. Ultimately, this will enable FIMA and its stakeholders to accurately track flood-affected properties and set flood insurance premiums. Moreover, addressing the data issues is crucial to FIMA's ability to comply with the standards and reporting requirements outlined in the *Foundations for Evidence-Based Policy Making Act of 2018*, the *Standards for Internal Control in the Federal Government*, the *DHS Data Quality Guide,* and other Federal regulations and guidance.

Recommendations

Recommendation 1: We recommend the Deputy Associate Administrator for Insurance and Mitigation prepare a strategy to hold vendors accountable for correcting transaction errors that occurred during permissive mode to improve NFIP data quality in the PIVOT system.

Recommendation 2: We recommend the Deputy Associate Administrator for Insurance and Mitigation incorporate a data quality assessment in its PIVOT operational reviews or other formal reports about progress of the NFIP modernization effort.

Recommendation 3: We recommend the Deputy Associate Administrator for Insurance and Mitigation develop a strategy to educate stakeholders about the data issues present in the historical NFIP data and publish caveats around the use of those data.

FEMA Response and OIG Analysis

FEMA concurred with all three recommendations. Appendix B contains a copy of the agency's response in its entirety. A summary of the agency's response to the recommendations and our analysis follows.

Recommendation 1: We recommend the Deputy Associate Administrator for Insurance and Mitigation prepare a strategy to hold vendors accountable for correcting transaction errors that occurred during permissive mode to improve NFIP data quality in the PIVOT system.

FEMA Response to Recommendation 1: Concur. The PIVOT Use Procedures (PUP) highlight the expected quality and timeliness requirements for WYOs and Vendors, including when transactions that were rejected or

have warnings must be addressed. PIVOT has built-in capabilities to review individual transactions and track remediation of any needed items. This information is included in oversight activities and reports that Federal Insurance and Mitigation Administration (FIMA) Industry Management Branch uses to oversee WYO performance. In addition, financial reporting of the companies requires that WYOs reconcile and concur with all transactions. As system development concludes and PIVOT shifts into a sustainment phase, FEMA will continue to review data submissions for quality, timeliness, and completeness, and refine the PUP as needed to reflect any increased standards. Through the operation review process, FEMA will also assess and take steps to improve the quality of WYO data submissions during permissive mode. FEMA also reviews the PUP for updates at least twice per year. The estimated completion date is August 31, 2021.

OIG Analysis: The agency's corrective action is responsive to the recommendation. We agree that enhancing the operation review process, tracking the remediation of data submission issues, and ensuring that WYOs reconcile and concur with all transactions are positive steps toward holding vendors accountable for transaction errors that have occurred during permissive mode. We also believe that assessing and improving the quality of data submissions made by WYOs during permissive mode will lead to improvements in the overall quality of data in the NFIP system. This recommendation will remain open and resolved until FEMA provides evidence that it has ensured erroneous transactions that vendors submit are corrected and the quality of the data allowed into the NFIP system has improved.

Recommendation 2: We recommend the Deputy Associate Administrator for Insurance and Mitigation incorporate a data quality assessment in its PIVOT operation reviews or other formal reports about progress of the NFIP modernization effort.

FEMA Response to Recommendation 2: Concur. NFIP will include PIVOT submission quality metrics in its operations reviews beginning in FY 2020. The estimated completion date is March 31, 2021.

OIG Analysis: The agency's corrective action is responsive to the recommendation. This recommendation will remain open and resolved until FEMA provides evidence that PIVOT submission quality metrics are included in its operations reviews.

Recommendation 3: We recommend the Deputy Associate Administrator for Insurance and Mitigation develop a strategy to educate stakeholders about the data issues present in the historical NFIP data and publish caveats around the use of those data.

FEMA Response to Recommendation 3: Concur. PIVOT reports already contain cover sheets, data dictionaries, and data disclaimers regarding the utility and source of data included. NFIP will continue to work with its stakeholders to identify data issues and remedy those to improve overall data quality. FEMA will ensure its PIVOT reports are updated to include statements about the quality of historic data and any limitations that should be included. The estimated completion date is May 31, 2021.

OIG Analysis: The agency's corrective action is responsive to the recommendation. We agree that continuing to identify and remedy historical data issues and ensuring its reports are updated to include statements regarding data issues and limitations are positive steps towards improving the use of historical NFIP data. This recommendation will remain open and resolved until FEMA provides evidence that PIVOT reports have been updated with statements about the quality of historic data and any limitations that should be included.

Appendix A
Objective, Scope, and Methodology

The Department of Homeland Security Office of Inspector General (OIG) was established by the *Homeland Security Act of 2002* (Public Law 107−296) by amendment to the *Inspector General Act of 1978.*

The objective of our audit was to assess whether the Federal Emergency Management Agency's Federal Insurance and Mitigation Administration (FIMA) addressed data quality issues as part of its efforts to modernize the National Flood Insurance Program (NFIP). As part of the audit, we explored whether and how FIMA considered known historical data quality issues when transitioning to PIVOT (its modernized NFIP system), and whether data quality has improved since migration. During our audit, we reviewed applicable laws, regulations, and DHS and FIMA policies related to data quality and the NFIP. Additionally, we reviewed published Government Accountability Office and DHS OIG reports relevant to our audit to identify prior findings and recommendations.

We visited FIMA headquarters in Washington, D.C., and conducted phone interviews with the contracting company FIMA engaged to develop and deliver PIVOT. During these interviews, we sought to understand the NFIP modernization plan, FIMA's treatment of data quality issues as part of the modernization process, and the successes and challenges FIMA faced following its transition to the modernized system.

We also visited five vendors that submit policy and claims data to FIMA as part of their service to the Write-Your-Own insurance companies. During these visits, we learned about the vendors' experiences with the modernized PIVOT system, including how their data submission processes changed since PIVOT was implemented, what was going well with the transition, and what challenges still needed to be addressed. We interviewed personnel responsible for modernizing the vendors' own systems to interface with PIVOT, and managing the transaction submission errors identified by the PIVOT edit checks.

Finally, we obtained historical NFIP data from September 1971 through September 2019, as well as new data submitted to and accepted by PIVOT from October 2019 through December 2019. We assessed the NFIP data and found it sufficiently reliable for the purposes of our audit. For example, we confirmed that the number of records matched control totals, field names were representative of the data populated in those fields, and duplicate records did not exist. We then used the NFIP data to test and confirm statements made by FIMA and NFIP vendors during our interviews. For example, by analyzing these data, we were able to determine the extent to which erroneous

transactions submitted to PIVOT through permissive mode were actually present in the system.

At no point in this audit did we request, obtain, or review classified information.

We conducted this performance audit between November 2019 and March 2020 pursuant to the *Inspector General Act of 1978*, as amended, and according to generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based upon our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based upon our audit objective.

Appendix B
FEMA Response to the Draft Report

U.S. Department of Homeland
Security
Washington, DC 20472

FEMA

October 6, 2020

MEMORANDUM FOR: Joseph V. Cuffari, Ph.D.
                   Inspector General
                   Office of Inspector General

FROM: Cynthia Spishak   CYNTHIA SPISHAK   Digitally signed by CYNTHIA
                                                             SPISHAK
                                                             Date: 2020.10.07 09:25:02 -04'00'
                   Associate Administrator
                   Office of Policy and Program Analysis

SUBJECT: Management Response to Draft Report: "FIMA Made Progress
                   in Modernizing Its NFIP System, but Data Quality Needs
                   Improvement" (19-036-AUD-FEMA)

Thank you for the opportunity to review and comment on this draft report. The U.S.
Department of Homeland Security (DHS), Federal Emergency Management Agency
(FEMA) appreciates the work of the Office of Inspector General (OIG) in planning and
conducting its review and issuing this report.

FEMA is pleased to note OIG's positive recognition of the improved ability to process
policies and claims data in a timely fashion, enhance reporting capabilities, and provide
more reliable policyholder address validation. Although still in the development stage,
PIVOT (not an acronym) has increased customer satisfaction, improved tracking of
properties, and led to better informed National Flood Insurance Program (NFIP)
Management. FEMA remains committed to supporting the NFIP's PIVOT transition.

The draft report contained 3 recommendations, with which FEMA concurs. Attached
find our detailed response to each recommendation.

Again, thank you for the opportunity to review and comment on this draft report. Please
feel free to contact me if you have any questions. We look forward to working with you
again in the future.

Attachment

**Attachment: Management Response to Recommendations
Contained in (19-036-AUD-FEMA)**

Recommendation 1: We recommend the Deputy Associate Administrator for Insurance and Mitigation prepare a strategy to hold vendors accountable for correcting transaction errors that occurred during permissive mode to improve NFIP data quality in the PIVOT system.

Response: Concur. The PIVOT Use Procedures (PUP) highlight the expected quality and timeliness requirements for Write Your Own (WYO) and Vendors; including when transactions that were rejected or have warnings must be addressed. PIVOT has the built-in capability to review individual transactions and track the remediation of any needed items. This information is included in oversight activities and reports that Federal Insurance and Mitigation Administration (FIMA) Industry Management Branch uses to oversee WYO performance. In addition, financial reporting of the companies requires that all transactions are reconciled and concurred upon by the WYOs. As system development concludes and PIVOT shifts into a sustainment phase, FEMA will continue to review data submissions for quality, timeliness, and completeness, and refine the PUP as needed to reflect any increased standards. FEMA will also assess and take steps to improve the quality of data submission made by a WYO during permissive mode through the operation review process. The PUP is reviewed for updates at least twice per year. Estimated Completion Date (ECD): 8/31/2021

Recommendation 2: We recommend the Deputy Associate Administrator for Insurance and Mitigation incorporate a data quality assessment in its Pivot operation reviews or other formal reports about progress of the NFIP modernization effort.

Response: Concur. The NFIP will include PIVOT submission quality metrics into Operation Reviews beginning in FY2021. ECD: 3/31/2021

Recommendation 3: We recommend the Deputy Associate Administrator for Insurance and Mitigation develop a strategy to educate stakeholders about the data issues present in the historical NFIP data and publish caveats around the use of those data.

Response: Concur. PIVOT reports already contain cover sheets, data dictionaries, and data disclaimers that talk about the utility and source of data in the reports. The NFIP will continue to work with our stakeholders to identify data issues and remedy those to improve overall data quality. The NFIP will ensure that these are updated to include statements about the quality of historic data and any limitations that should be included. ECD: 5/31/2021

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Appendix C
Office of Audits, Technology Audits and Analytic Support
Major Contributors to This Report

Tuyet-Quan Thai, Director
Beverly Burke, Audit Manager
Gaven Ehrlich, Senior Program Analyst
Joshua Wilshere, Supervisory Data Architect
Nandini Parvathareddygari, Data Architect
Minxia Song, Data Architect
Adam Russell, Data Analyst/Contractor
Shawn Ward, Senior Program Analyst
Tressa Waters, Senior Auditor
Kevin Dolloson, Communications Analyst
Falon Strong, Referencer

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