

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Duke)
Energy Ohio, Inc., for Approval to Change) Case No. 16-387-GA-AAM
Accounting Methods Associated with its)
Integrity Management Program.

**ANNUAL REPORT OF DUKE ENERGY OHIO, INC.,
FOR 2018 EXPENSES**

Duke Energy Ohio, Inc., (Duke Energy Ohio or Company) respectfully submits the following report, detailing its integrity management related expenses incurred during 2018 and eligible for deferral:

1. Duke Energy Ohio is an Ohio corporation engaged in the business of providing natural gas service in southwest Ohio and, as such, is a public utility as defined by R.C. 4905.02 and 4905.03.

2. On January 4, 2017, the Public Utilities Commission of Ohio (Commission) issued an Opinion and Order in the above-captioned proceeding, approving the Company's application to defer expenses related to the implementation of its gas distribution integrity management program (IMP) developed in response to federal regulations.¹

3. The IMP approved in the Order comprises six initiatives:
- a. Enhancing risk assessment and analysis
 - b. Improving records
 - c. Training
 - d. Damage prevention
 - e. Inline inspection and pressure testing techniques

¹ *In the Matter of the Application of Duke Energy Ohio, Inc., for Approval to Change Accounting Methods Associated with its Integrity Management Program*, Opinion and Order (January 4, 2017) (Order).

- f. Maximum allowable operating pressure verification
- 4. The Company's application specifically requested authority to defer its income statement recognition of the IMP costs incurred after December 31, 2015, with the annual increase not to exceed \$4 million per calendar year. In addition, the Company requested authority to recover carrying charges on the deferred balance.
- 5. Duke Energy Ohio and Staff of the Commission entered into a stipulation (Stipulation) that, *inter alia*, proposed a process to be followed with regard to the proposed deferral authority.² One of the steps in the process provided that:

By June 1 of each year, Duke shall file an annual report detailing the deferred expenses, external auditor findings, baseline performance levels for each safety initiative, safety performance improvements compared to baselines, results of ongoing and future investigations, any mid-term adjustments, and efforts towards identifying efficiencies and implementing cost-savings measures.

- 6. For purposes of this Annual Report, the Company provides the following attachments:

Attachment A: 2018 IMP-Related Deferrals

Attachment B: Audit Report

Attachment C: 2018 Programmatic Review

WHEREFORE, Duke Energy Ohio respectfully provides this annual report for the Commission's review and requests that all 2018 IMP-related expenses be deferred, together with associated carrying costs.

² The Commission specifically approved the Stipulation in the Order, at ¶¶ 15, 23.

Respectfully submitted,

DUKE ENERGY OHIO, INC.

/s/ Jeanne W. Kingery

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CERTIFICATE OF SERVICE

I hereby certify that a true and accurate copy of the foregoing motion was delivered by U.S. mail (postage prepaid), personal, or electronic mail, on this 3rd day of June, 2019, to the parties listed below.

/s/ Jeanne W. Kingery
Jeanne W. Kingery

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Duke Energy Ohio
Integrity Management Deferrals
12 Months Ended December 31, 2018

Deferral Category & DE Project Code	DE Project Code Description	January	February	March	April	May	June	July	August	September	October	November	December	2018 Spend Totals
DIMP Projects														
Risk Assestment and Analysis														
IMRSKOPT	Optimain xDR Software								\$41,500					\$41,500
Records														
SCANIDX15	Scanning & Indexing Project Phase 2	\$249,467	-\$150,294	\$65,508	\$7,634	\$2,893	\$7,193	\$6,132	\$8,062	\$9,113	\$10,706	\$4,917	\$9,453	\$230,782
CPMANCON	CP Manager - Data Enhancement	\$14,819	\$41,540	\$5,509	\$7,156	\$4,756	\$6,557	\$4,474	\$6,695	\$5,789	\$9,312	-\$1,886		\$104,722
322957OH	EGIS & Gas Fusion Dynamic Linkages	\$18,983	\$24,285	\$45,153	\$13,791	\$24,303	\$15,214	\$6,092	\$5,268	\$1,971	\$3,651	\$4,482	\$4,995	\$168,189
IM880PDM	Pipeline Data Management												\$4,810	\$4,810
GSMART5	Leak Survey / Line Patrol		\$121	\$30	\$30									\$181
GSMARTLKSV	Leak Survey	\$381	\$604	\$94										\$1,079
Training														
IMEXCDAM	Radio Ads, Billboards & Mailings			\$86,108		\$38,889	\$62,670	\$23,120	\$7,038	\$20,590			\$450	\$238,864
IMTRAIN	Backhoe Simulator				\$28,051	\$5,000	\$19,898							\$52,949
Damage Prevention														
TRCCORMN	Traceability Corrective Maintenance on Mains	\$10											\$122	\$132
TRCCORSV	Traceability Corrective Maintenance on Services	\$20			\$26,301								\$420	\$26,741
TRCINV	Traceability Investigations	\$42,493												\$42,493
UNTNORMN	Untonable Corrective Maintenance on Mains	\$8,124	\$13,379	\$12,696	\$14,527	\$7,578	\$10,035	\$5,480	\$8,738	\$17,257	\$15,167	\$82,429	\$50,134	\$245,544
UNTNORSV	Untonable Corrective Maintenance on Services	\$46,305	\$24,835	\$28,122	\$48,425	\$52,509	\$51,971	\$42,856	\$680	\$70,856	\$52,533	\$40,098	\$52,646	\$511,835
UNTNINV	Untonable Investigations					\$1,293								\$1,293
TIMP Projects														
ILI and Pressure Test														
INLNINSP	ILI C314	\$9,357							\$43,910	\$163,106	\$0	\$528,601		\$744,975
MAOP Verification														
MAOPCON	Midwest Gas Clean-Up Project	\$6,209	\$8,499	\$4,927	\$7,387	\$14,538	\$13,770	\$42,644	\$35,782	\$1,730	\$39,528	\$3,374	\$16,237	\$194,624
Totals		\$396,169	-\$37,033	\$248,147	\$153,301	\$151,759	\$187,308	\$130,797	\$157,672	\$290,412	\$130,897	\$662,015	\$139,267	\$2,610,712

[illegible]

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INDEPENDENT ACCOUNTANTS' REPORT ON APPLYING AGREED-UPON PROCEDURES

To the Board of Directors of
 Duke Energy Ohio, Inc.
 550 South Tryon Street, Suite 4400
 Charlotte, North Carolina 28202

We have performed the procedures enumerated below, which were agreed to by the management and board of directors of Duke Energy Ohio, Inc. (the "Company") and the Public Utilities Commission of Ohio (the "PUCO"), related to the Company's compliance with the determination of Gas Integrity Management (GIM) deferral costs for the year ended December 31, 2018 as described in PUCO Case No. 16-387-GA-AAM (the "Order"). Management of the Company is responsible for the Company's compliance with the Order. The sufficiency of these procedures is solely the responsibility of the parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures enumerated below either for the purpose for which this report has been requested or for any other purpose.

The procedures and the associated findings are as follows:

1. We obtained from Company management the Integrity Management Deferrals schedule ("the schedule") for the period from January 1, 2018 to December 31, 2018 which include the GIM cost deferrals by month, as outlined within the Order, and to be filed as a part of the annual report, and proved the mathematical accuracy of the schedule.
 - a. We compared the monthly GIM costs from the schedule obtained in Step 1 above to the general ledger and noted a \$340,212.72 difference, prior to adjusting for any reconciling items. Per Company management, this difference was due to a credit booked in the general ledger in March of 2018 to correct 2017 deferral amounts per the general ledger. The general ledger does not retrospectively update the previous year so this credit was included in the 2018 cost deferrals per the general ledger; however, in the schedule, the costs related to 2017 were reflected in 2017.
- | GIM Costs per the Schedule | GIM Costs per the G/L | Variance |
|----------------------------|-----------------------|--------------|
| \$2,610,713.03 | \$2,270,500.31 | \$340,212.72 |
- b. We randomly selected three months (January, September, December) from the period January 1, 2018 through December 31, 2018. For each selected month, we obtained a detail of all GIM costs deferred for that month and compared the total of the detail to the monthly total for the selected month in the schedule obtained in Step 1 above, and noted that no adjustments were made and that the amounts were in agreement, within rounding.
 - c. We randomly selected 25 items from the selected details of GIM costs obtained in Step b above. For each selection, we agreed the selected GIM expense to the underlying support provided by management, noting the support received. We also compared the category and nature of the expense to the guidelines established within the Order. See below for the results of our procedures performing, including the support received.
 - i. We selected 13 contract labor charges, and agreed the selected charge to the contractor billing detail.
 - ii. We selected 12 third party service charges and agreed the charge selected to the third-party invoice.

We found no exceptions as a result of the procedures in steps 1b and 1c.

2. We obtained from Company management the monthly detail of the carrying costs included in the GIM cost deferrals for the period January 1, 2018 through December 31, 2018 and performed the following procedures:
- a. We compared the monthly detail of the carrying charges to the total carrying charges included in the detail obtained in Step 1 above and noted a \$311 difference, prior to adjusting for any reconciling items. Per Company management, this difference was due to a credit booked in the general ledger in February 2019 to correct 2018 carrying charges per the general ledger. The general ledger does not retrospectively update the previous year so this credit was not included in the 2018 carrying charges per the general ledger; however, in the schedule, the costs related to 2018 were reflected in 2018.

Carrying Costs per the Schedule	Carrying Costs per the G/L	Variance
\$222,178	\$222,489	\$311

- b. We randomly selected three months (January, September, December) and recalculated the monthly carrying charges for the selected months by multiplying Duke Energy Ohio, Inc.'s average of the monthly beginning and ending balance by the PUCO approved three percent per annum rate without compounding and noted that the amounts were in agreement.
- c. We reviewed the Order and confirmed that the PUCO approved carrying charge rate is three percent per annum.

We found no exceptions as a result of the procedures in steps 2b and 2c.

This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. We were not engaged to and did not conduct an audit or any part thereof, the objective of which is the expression of an opinion on the compliance with the Order as of December 31, 2018. Accordingly, we do not express such an opinion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

This report is intended solely for the information and use of the board of directors and management of the Company and the PUCO and is not intended to be, and should not be, used by anyone other than the specified parties.

Deloitte & Touche LLP

May 29, 2019



OH
Deferral

2018

This document is intended to show how Duke Energy is using the Deferral request from the PUCO to establish programs to reduce risk and provide a higher level of safety to the public.

Programs & Performance

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CHANGES TO THE 2018 REPORT AND BEYOND

In 2018 Duke Energy Ohio started utilizing Power BI software. This software allows for a greater level of analysis over a conventional Excel pivot chart. Power BI connects to the same data shown in previous reports but allows the visualization of what has changed year over year for a more in depth explanation of where the change is rooted. Readers of this report will notice that most the charts provided in the metrics sections have been enlarged and the significant year to year changes are shown to provide that deeper level of understanding.

EXPLANATION OF VARIANCE

Duke Energy Ohio, Inc., spent \$2.61 million of the projected \$3.35 million in 2018 for the system integrity deferral initiatives listed in its approved application. This is a variance of 18.44% under the projected amount. Actual spend was lower due to delays in getting Optimain XDR implemented, getting Traceability & Untoneability contracts awarded and the cost of integrity digs for C314 ILI were capitalized.

Deferral Initiative	2018 Actual Spend	2018 Year End Projection	Deferral Application Spend	Actual - Projection	% Variance
DIMP – Risk Assessment and Analysis	41,500	165,000	850,000	-123,500	-14.53%
DIMP – Records	509,763	605,934	1,200,000	-96,171	-8.01%
DIMP – Training	291,813	350,175	200,000	-58,362	-29.18%
DIMP – Damage Prevention	828,037	993,645	750,000	-165,608	-22.08%
TIMP – ILI and Pressure Test	744,975	1,000,000	1,000,000	-255,025	-25.50%
TIMP – MAOP Verification	194,624	233,549	0	-38,925	N/A
Total	2,610,712	3,348,303	4,000,000	-737,591	-18.44%

Table 1: Deferral Variance

DIMP – RISK ASSESMENT & ANALYSIS

This program consists of implementing new software, and improving data collection and data quality to support the risk assessment models. Improving the collection of our data to be used in analysis software will allow improved ability to meet the requirement in CFR 49 192.1007(a), which states a gas operator must demonstrate an understanding of its gas distribution system. As a result of better system knowledge, the requirement in CFR 49 192.1007(c) (to evaluate and rank risk) will experience an improvement in quality because information gathered about the distribution system is used to calculate and rank risk.

The overall program goal for improving risk assessment and analysis will have a safety benefit to the general public by allowing Duke Energy Ohio to develop programs and activities to reduce risk. These programs are a requirement under CFR 49 192.1007(d) (to identify and implement measures to address risks). However, as the code is not specific with regard to what programs are required to address risk, it is up to the individual operator to determine what programs they will implement based on their risk profile. With a deferral program that is specific to risk assessment and analysis, Duke Energy Ohio should be able to create more specific and targeted programs that eliminate more risk at a lower cost, thereby providing more benefit to the general public.

Program Metrics

Program metrics are high-level measures of performance that are not specific to any single project under the program but should reflect improvement based on the cumulative effect of all the individual projects. These metrics tend to be leakage based, lagging indicators, which means that the information was collected from a repaired leak during a specific year. Every leak has a potential impact to public safety. Thus, a reduction in leaks will have a direct impact on safety.

Leaks Caused by Corrosion on Mains & Services

Due to the fact that the only project under this program is specific to corrosion, there should be a reduction in the rate of corrosion leaks at the completion of the project. The chart below shows how corrosion leaks have been dropping consistently from 2013 to 2018. This drop is attributed to other programs and activities to reduce risk, outside the scope of this program (e.g. AMRP), that have had an impact on corrosion leaks. In 2018 the count of leaks was dropped from 2017. Further analysis of the data showed that leaks on copper pipe and coated steel continued to drop but that was slightly offset by an increase in leaks on bare steel. Furthermore, a decrease was noted in both hazardous and non-hazardous leaks.

As a baseline, a rolling six years of data will be utilized. At the conclusion of the project under this program, the baseline will be noted as the leak rate of that rolling six years. Improvements resulting from the project will be determined based on the leak rate of the rolling six years of information at the conclusion of the project.

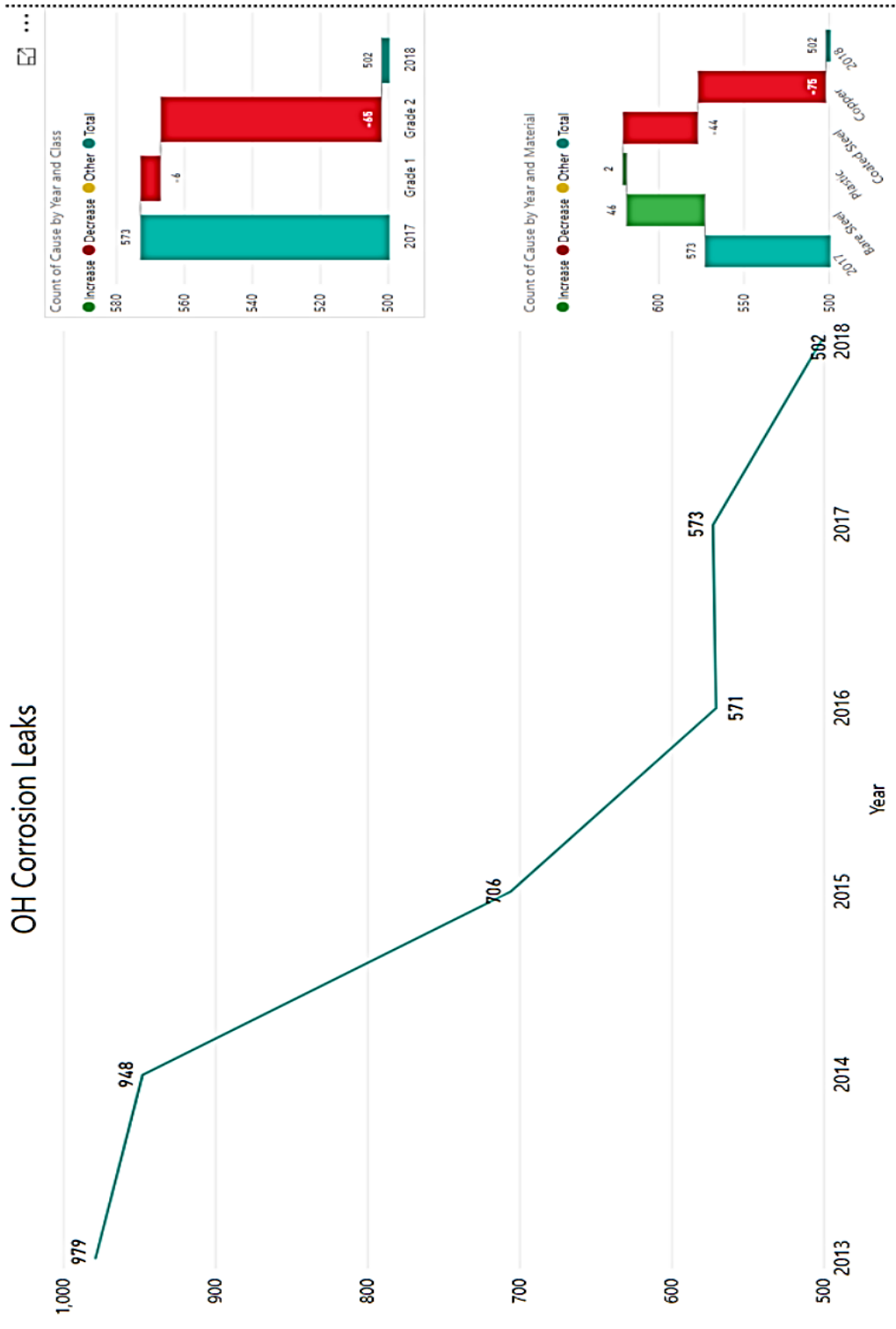


Figure 1: Ohio Corrosion Leaks on Mains & Services

Cathodic Protection (CP) Manager Project

History

The CP Manager Project was initiated on February 17, 2014, as part of a larger overall project known as Gas SMART. The SMART acronym stands for the following:

- Simplify the Portfolio
- Mobility
- Automation
- Reporting
- Technology Strategy

Many inefficiencies were targeted under this project, which included improving customer information for meter inspections, providing field personnel access to maps, asset information, key gas operations records, operational procedure documents and the CP Manager Project. The following table provides a list of goals and objectives for the entire Gas SMART Project.

Goals	Objectives
Increase work process efficiencies	<ul style="list-style-type: none">• Provide access to map and Gas asset information for field personnel, to provide efficiencies in decision-making and work processes.• Provide additional customer data to Meter Tracking System (MTS) to reduce research time
Reduce time required to handle data for work being scheduled, performed, and closed.	<ul style="list-style-type: none">• Utilize currently existing capabilities for work to be performed and stored while out of mobile device communication range, and synchronize when crew is within range.• Provide and receive electronic information that is legible (not handwritten)• Decrease back office support currently required with paper forms
Reduce time to provide managerial and regulatory reporting, both scheduled and ad hoc.	<ul style="list-style-type: none">• Provide inspection information in structured data that can be reported on• Retire paper forms• Provide pre-filled information to field personnel that can be determined from data stores/databases
Reduce risk of regulatory fines from incomplete and/or inaccurate data	<ul style="list-style-type: none">• Improve data quality error prevention via the data entry design.• Ensure that data housed in data stores for multiple applications is consistent and well defined
Promote environmental sustainability	<ul style="list-style-type: none">• Replace paper field forms with mobile, electronic forms

The goals listed above for the Gas SMART project provide safety and financial benefits to the Company. Having a more efficient method of performing work results in less

downtime for employees. Record improvements and CP manager were designed to provide better information to front-line workers to make better decisions and manage their daily work schedule. Better information that allows better decisions is a benefit to the public because it reduces the chances of human error while performing work on our pipelines.

Goal

The goal of the Cathodic Protection (CP) Manager project is to improve cathodic protection records accuracy by integrating all pipeline test circuits from our Corrosion Department's software (Pipeline Compliance System, PCS) with our GIS mapping software (Smallworld by GE). Smallworld is the system of record for pipelines, corrosion circuits, and cathodic protection (CP) read locations. PCS is the system of record for field-generated CP reads. This project is merging the two systems into one business process. By using Smallworld as a single source for system records, duplicate data entry will be eliminated and data quality, availability, and accessibility will be improved.

Scope

The following was the original scope of the project identified by the project team:

- Integrate corrosion data between EGIS and Pipeline Compliance System (PCS)
- Upload historical riser data into EGIS
- Provide reporting capabilities of inspection status
- Enable scheduling functions for corrosion inspections
- Reconcile casing ID number and test points used in EGIS and PCS
- Provide ability to add additional assets required for corrosion monitoring in EGIS
- Provide ability to record corrosion maintenance activities
- Provide ability to view corrosion data points that have anomalies
- Coordinate corrosion and casing inspections within the same vicinity
- Provide a read sequence for test points

Timeline

Step 1 – Reconciliation

A reconciliation process is currently underway to match circuits between PCS and Smallworld. Part of the reconciliation process involves field work to verify insulated sections of steel main and services, and to add cathodic test stations at insulated joints. The reconciliation process alone will have a positive impact on public safety by ensuring that Duke Energy Ohio is providing cathodic protection and taking reads on all steel pipelines and pipeline appurtenances. This is an essential piece of corrosion protection that is required by federal code under CFR 49 192.451 through CFR 49 192.491, and is a program or activity to reduce risk. There are approximately 10,000 circuits that need to be built and approximately 60% of those will need to be field verified. The reconciliation process is scheduled to be complete by the end of 2018.

Step 2 – Risk Assessment

Once this project is completed, the CP reads will be used in a pipe segment corrosion risk model to identify areas within our system where corrosion is more likely to occur. The model will create a heat map that will graphically target areas that our corrosion technicians can concentrate on providing additional cathodic protection to the pipeline segments identified. In addition, Duke Energy Ohio can develop additional programs and activities to address risk, such as more frequent leak surveys, on the identified areas in the corrosion risk model. We expect to see a reduction in the number of test reads falling below the minimum accepted criterion of -850 mV listed under appendix D of CFR 49 Part 192 for adequate cathodic protection. A reduction in the number of reads not meeting the criterion lowers the chances of a potential leak caused by corrosion which provides an increased safety benefit to the public. The corrosion risk model has been developed and is ready to implement CP reads as a factor once the reconciliation process is complete. The image below is an example output from our segment-based corrosion risk model.

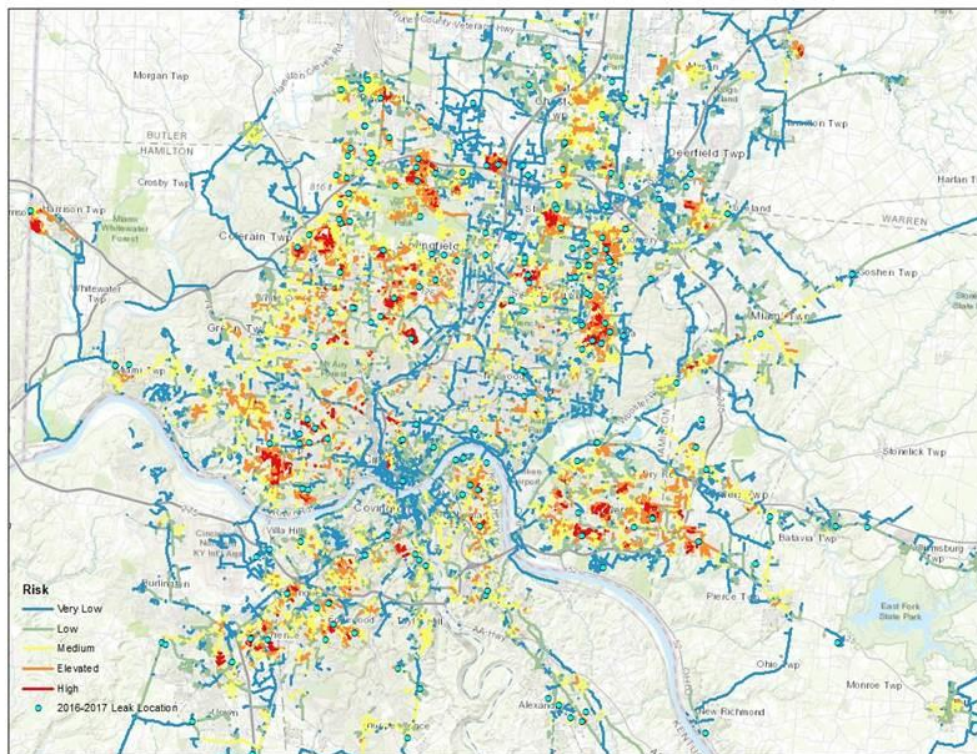


Figure 2: Sample Output from GIS Based Corrosion Risk Model

Metrics

Metrics associated with the CP manager project are designed to show the benefits of having reconciled information between PCS and Smallworld and improvements in risk assessment.

CP Manager Metric 1 – Percent of Inadequate CP Reads

This metric shows our performance measure of the percent of total reads that fall below the criterion for adequate cathodic protection described previously. The established baseline will be the average of reads falling outside this criterion between the years 2012 to 2016. A drop to below the baseline average is expected after the completion of this project. It should be noted that there may be a brief increase in the total percentage of reads outside the criterion before a drop, due to the fact that, in the execution of this project, Duke Energy Ohio may find new segments that are unprotected or below the criterion that had not been previously known. The table below shows the performance measure of the percent of inadequate CP reads.

In 2018 all values were revised because a more sophisticated search query was available through SQL. The same query was applied across the entire range of dates for consistency. The results show an increase in the percentage of total test reads showing inadequate cathodic protection which was not unexpected because the program is helping Duke Energy discover find new segments that may not have been previously known.

Year	Percentage of Total Test Reads showing inadequate CP
Baseline	5.94% (2012-2016 Avg)
2017	6.71%
2018	7.33%
2019	
2020	

Table 2: Percent of CP Reads Above -850mV

CP Manager Metric 2 – Additional Programs and Activities to Address Risk

Upon the completion of the reconciliation process and utilization of the risk model, Duke Energy Ohio may develop additional programs and activities that are targeted to high-risk segments of pipeline identified by the corrosion risk model. The year the program was implemented, name of the program, and a brief description of the program will be listed in the table below.

Year	Program to Address Risk	Description
2017	No Programs Added	CP Manager is currently under the reconciliation process.
2018	No Programs Added	CP Manager is currently under the reconciliation process.
2019		
2020		

Table 3: Additional Programs Initiated from use of Corrosion Risk Model

Safety Intent

CP manager is designed to improve public safety by having a centralized location of verified information that can be used as a factor in predictive analysis of corrosion leaks. This predictive analysis will enable Duke Energy Ohio to be proactive in establishing programs to address risks, such as accelerated leak surveys, additional cathodic protection, etc. Having a complete and verified CP manager program improves the data used to perform this predictive analysis. Having a higher quality information source produces higher quality results in evaluating risk with respect to corrosion. CP manager will play a major role in this effort.

Optimain xDR

OpvanteK's cloud-based software engine provides risk-based predictive analytics on all 811 notifications sent from one call centers to underground facility owners. Real-world results across the country show that more than 50% of damages occur on tickets ranked in the top 10% by the Optimain xDR engine. This profound insight allows every stakeholder involved in the damage-prevention process to focus activities on higher-risk tickets.

History

For decades, technical options limited damage prevention to focus mainly on reacting to damages.

The PIPES Act of 2016 commissioned a congressional study on improving damage prevention technology including (section 8(b)(2)):

An analysis of how increased use of global positioning system digital mapping technologies, **predictive analytic tools**, public awareness initiatives including one-call initiatives, the use of mobile devices, and other advanced technologies could supplement existing one-call notification and damage prevention programs to reduce the frequency and severity of incidents caused by excavation damage;

Predictive analytics encompasses a variety of statistical techniques from data mining, predictive modelling, and machine learning, that analyze current and historical facts to make predictions about future or otherwise unknown events.

Optimain xDR was developed using this predictive analytics technique to determine where excavation damages are most likely to occur and perform some additional outreach to prevent those damages.

Goal

The ultimate goal of using this software is to risk rank excavation tickets which will allow in conjunction with the Watch and Protect Program (See Damage Prevention Section), reduced excavation damages. Additional value added benefit of using this software with the Watch and Protect program are:

- Add a proactive element to damage prevention
- Employ the power of data analytics and GIS to predict risk
- Identify high risk excavation before it occurs
- Develop process/systems with proactive preventative actions to mitigate risk
- Facilitate DIMP Programs / accelerated action plans
- Improve pipeline safety, decrease outages, reduce costs from damage

Scope

The scope of Optimain xDR currently covers the three districts with natural gas service in the state of Ohio served by Duke Energy Ohio. All one call tickets that warrant a locate near Duke Energy Ohio facilities, will be risk ranked and prioritized for additional outreach through the Watch and Protect Program.

Timeline

The software was first purchased in 2018 and will be ongoing provided that the use of the software provides beneficial results. Full use of the software is expected to begin in 2019.

Metrics

TBD – Metrics will be provided once the program is fully functional with the Watch and Protect Program

Safety Intent

Hitting a natural gas pipeline has serious consequences. Even a tiny gouge, scrape, dent or crease to a gas pipe or its coating may cause a leak that could lead to a catastrophic fire or explosion. Duke Energy Ohio's greatest risk to the distribution system has consistently been excavation damage for years. By being proactive and communicating with excavators on high risk tickets, Duke Energy Ohio can provide a greater safety benefit to excavators and the general public.

DIMP – RECORDS

This program will improve the processes and procedures on how records are collected, stored, and retrieved, as well as consolidating and cleaning up record information to achieve traceable, verifiable, and

complete records. New technologies designed to reduce human errors and risks associated with data collection will be implemented to provide more accurate information.

The overall program goal is to have complete records in a common location that provides easy indexing and retrieval. This improvement creates a system of record that provides accurate information to all facets of Duke Energy Ohio. This program also helps Duke Energy Ohio meet the requirement under CFR 49 192.1007(a) that a Gas Operator must take steps to learn more about its system. This system knowledge is key in identifying threats that could create risk to the public.

Program Metrics

As a direct result of having accurate records, our contractors and company personnel will be able to locate our facilities with improved accuracy. If a gas facility is not locatable by conventional methods, it can be located by as-built drawings if the drawings are available. Thus, damages caused by inaccurate or missing maps or records should trend downward in future years.

The baseline for analysis of the overall program will be the leak rate on damages – facility records/maps inaccurate, on a rolling seven years of data. For 2018, there was an increase over the previously flat baseline. It was determined that this increase can be attributed by the use of a third party contractor to perform root cause analysis on all damages which started halfway through 2017. The use of this contractor has led to a precipitous decline in the use of “other”, “unknown” and “abandoned facilities” as the root cause. The second chart below illustrates this decline. The largest decline was shown in the use of “abandoned facility”. Duke energy made the decision that “abandoned facility” was not sufficient as a root cause and should be placed under “facility records / maps inaccurate”. In the future, we expect this program will drive the leak rate on this metric below zero. The following graph shows the damages – facility records/maps inaccurate, for Ohio.

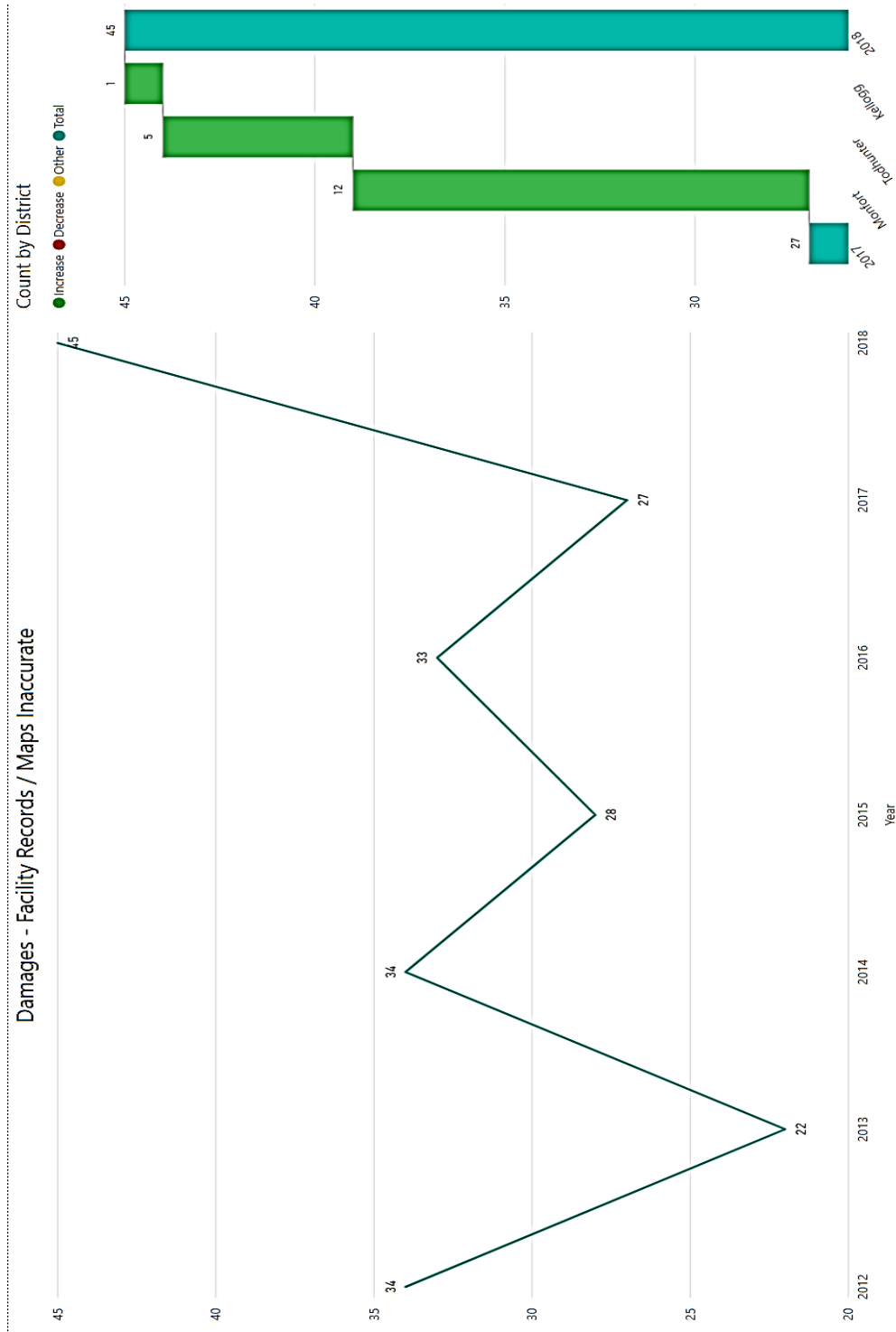


Figure 3: Ohio Damages Cause by Facility Records / Maps Inaccurate

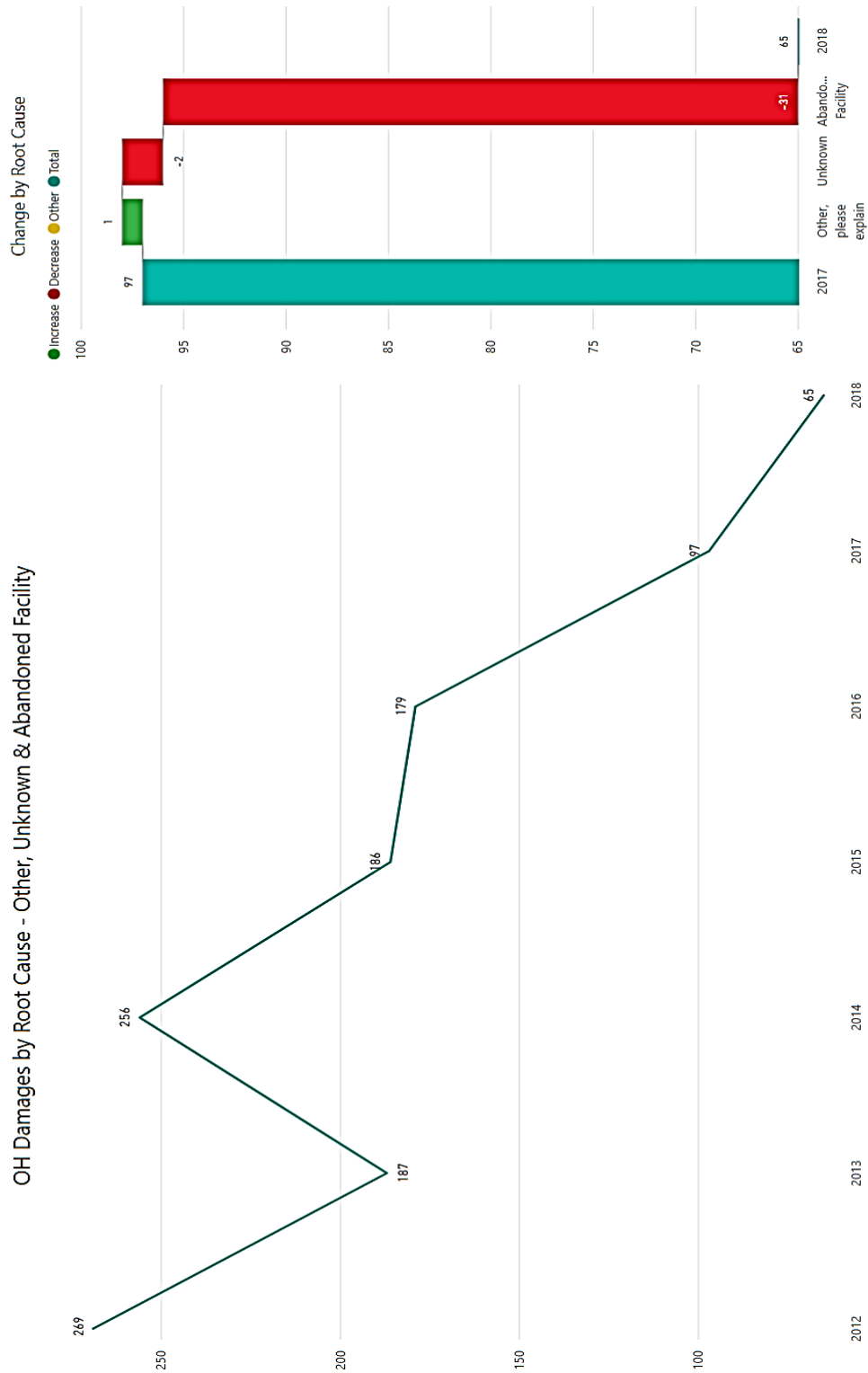


Figure 4: Ohio Damages by Other, Unknown & Abandoned Facility

Scanning & Indexing Project

Duke Energy Ohio is committed to having reliable, traceable, verifiable, complete, and accessible records for its system. As part of this effort, Duke Energy Ohio has found many paper records that were not yet scanned into the system of record. This project accelerates the rate of scanning these records and provides a structured file system so they can be more easily retrieved in the future.

History

Prior to this project, staff was scanning and loading only current jobs (all associated paper records) into the company Document Management System. For all legacy jobs (prior to 2008), staff had to pull paper records from file storage or from network drives and make them available to engineering or field operations. This was a long process, making it difficult to track documentation or retrieve any records supporting engineering or field operations.

Goal

The goal of scanning documents is to have all records in one central system of record. Indexing documents allows the easy location and retrieval of necessary records. Both of these parts of the scanning and indexing project provide a benefit to the public by having necessary information to perform operations and maintenance on our pipelines.

Scope

This project consists of:

- Transforming paper records, reel and frame records, and microfiche records to digital format;
- Loading digital data into our document management system known as Fusion/FileNet;
- Adding metadata to digital records for indexing and future retrieval from Fusion/FileNet;
- Validating System of Record attributes using verifiable asset data;
- Populating System of Record attributes using verifiable asset data; and
- Establishing processes for new pipeline asset records and data.

Timeline

Project is divided into two phases. Phase one includes the original scope of documents identified, and phase two includes the additional documents found. Phase two was added because of additional documents not found in the original search. Phase one should be completed by 2017 while Phase two should be completed by late 2019.

Metrics

Metrics to evaluate the performance specific to the scanning and indexing project consist of the following:

- Paper Pages Scanned – The count of paper documents that have been scanned and placed into the system of record
- Files Indexed – The count of files indexed to the new indexing system
- Index Count – Total count of indexes across all files
- Records Uploaded to Fusion / FileNet – Records uploaded that can be accessed through our GIS system of record

The baseline on each metric will be the total population of items identified by the project. Since this project has a clear start and finish identified by the baseline, the performance of each of the metrics will be evaluated on the progress toward completion. The table below shows the baseline and progress toward completion.

Description of Work	Estimated Project Total Quantity (Baseline)	Cumulative Quantity Completed in 2017	Cumulative Baseline % Complete in 2017	Cumulative Quantity Completed in 2018	Cumulative Baseline % Complete in 2018
Paper Pages Scanned	758,442	943,709	124%	211,867	152%
Files Indexed	2,828,245	2,474,002	87%	69,765	90%
Index Count	9,449,762	12,423,887	131%	321,223	135%
Records Uploaded to Fusion / FileNet	1,094,647	692,311	63%	90,000	71%

Table 4: Scanning Project Progress Toward Completion

Safety Intent

Scanning and indexing of records improves the safety to the public by providing Duke Energy Ohio contractors and employees with a common source of easily retrievable information when performing operations and maintenance on our pipelines. Quick retrieval of work orders and documents is essential when in an emergency situation and more information is required in order to make a good decision. In addition to emergency situations, this common repository of easily accessible information allows engineering, field operations, system operations, construction, and other groups to be able to make more informed decisions that impact the scope of work they perform. Finally, this repository allows Duke Energy Ohio to comply with the requirement to keep records for the lifetime of the asset.

Gas Fusion Document Classes Project

After the project deployed, Fusion became a 3-tiered structured with 12 document classes, 47 document types, and 260 document subtypes. This reorganization of the classes and application structure provides a better means to manage legacy records in various stages, making them easier to look up for faster customer response, while providing for expansion to meet the growing needs of Integrity Management and new regulations.

History

The project was used to expand the document libraries in our document management system in support of the Scan & Index Project. Prior to this project Duke Energy Ohio filed hard-copy records that were not classified in the document library with supporting metadata. These files were added to a completed file-job folder, which could contain many documents. This made finding a specific document, such as a pressure chart, very difficult. The libraries and additional document classes provided a more organized structure and allowed for more efficient access to records, as well as the ability to store additional metadata supporting those documents. The metadata enhancements to the documents allow us to make Reliable, Traceable, Verifiable and Complete (RTVC) records more accessible. This project was the platform for record storage and growth as more documents have been identified concerning our assets.

Goal

The goal of the Gas Fusion Document Class project was to enhance the class structure of Gas Operations' document management system known as Fusion/FileNet, making it easier for office and field personnel to access and search records.

Scope

The scope of this project was to take the 10 document classes and create a 3-tiered structure with 12 document classes, 47 document types and 260 document subtypes. This allowed Duke Energy Ohio much more accuracy in document classification, going from a limited 10 combinations of information to 146,640 possible combinations.

Timeline

This project began in fall of 2015 and was completed July 2016, however additional documents continue to be found in excess of the original projected scope of the project. This project will be ongoing to allow for the processing of the additional documents

Metrics

This project is 100% complete with regard to the original projected scope. No current metrics are available for this project. Refer to the overall program metrics in table 4 for scanning and indexing.

Safety Intent

Gas Fusion Document Classes project improved public safety by providing Duke Energy Ohio contractors and employees with a common source of easily retrievable information when performing operations and maintenance on our pipelines. Quick retrieval of work orders and documents is essential when in an emergency situation and more information is required in order to make a good decision. In addition to emergency situations, this common repository of easily accessible information allows engineering, field operations, system operations, construction and other groups to be able to make more informed decisions that impact the scope of work they perform. Finally, this repository allows Duke Energy Ohio to comply with the requirement to keep records for the lifetime of the asset.

Dynamic Linking Project

History

There is a Comma Separated Value (CSV) Checker / Loader application in Enterprise Geographical Information System (EGIS) that allows image files in FileNet to be referenced and retrieved for display from within EGIS. The application includes a batch validation process that launches from within EGIS to validate new gas image file information against related gas objects in EGIS to ensure they are in sync, and creates the URL linkage between EGIS objects and FileNet files in Fusion.

Goal

The CSV Checker / Loader application needs to be updated to create URLs to FileNet using the new Fusion Document Class structure that was implemented in August 2016. Document Classes went from a flat structure with ten Document Classes to a structure with Document Classes, Document Types, and Document SubTypes.

Scope

Pre-Work Completed: Analysis of Document Classes to provide the business with a list of valid Document Classes, Document Types, and Document SubTypes.

Project Work: Update the Checker Loader application in EGIS to be able to create a URL string to FileNet in Fusion for the new Document Class file structure, including Document Type, Document Sub Type, and Document Sub Class. (Checker Loader logic is written in Magik code.)

- The business needs to determine which documents in Fusion are required by the business to access from EGIS. Now that the merged organization structure is available, meetings can be set up to match managers to the documents required by their groups.
- Identify the specific class meta data values for each document class that need to be displayed in EDMDS search screen.
- Build additional EDMDS configurations for additional document classes to display the specific class meta data values.
- Configure EGIS to go to the EDMDS search display (even if only one document is found) instead of auto-opening objects. The EDMDS search display will be configured to display valid meta data for the object. (This was done as a production configuration modification and does not require additional hours in this project.)
- The EGIS Magik code will need to be modified to accommodate multiple document classes providing the capability to build the URLs.
- Perform analysis to determine if EGIS has sufficient memory and database resources to handle the influx of document reference objects and remediate as needed.

- Load the MyWorld table(s) with the new EDMDS URL link, and also assess any other downstream application impacts. This may need to be tied to an EGIS hotfix or release.

Metrics

	Number of static links assignments TOTAL (edmds in name)	Number of Static Links being Replaced	Number of Static Links Remaining	Number of new Dynamic Links (from metadata)
Mains	159,966	83,092	76,874	2,722
Casings	552	0	552	Unknown at this time
Valves	924	0	924	Unknown at this time
Services	397,818	385,205	12,613	291,971
Measurement	12	0	12	Unknown at this time
Event History	229,942	225,347	4,595	236,598

Safety Intent

Dynamic linking of documents allows more efficient work processes. This added efficiency is crucial to obtaining records in emergency situations when seconds count. In addition, it will allow our contractors to have more detailed information available to them when needed. This increase in available information will help all parties make better decisions.

DIMP – TRAINING

Reducing incidents has a direct safety benefit to the public. Well trained and educated employees are critical to Duke Energy Ohio performing successful and incident free operations and maintenance to its pipelines. The activities associated with operations and maintenance, such leak surveys and pipeline inspections, prevent incidents from occurring and thereby reduce exposure to risk.

The goal of this program is to have a workforce prepared to support the growth and safety of a reliable natural gas distribution system. To attain this goal, the program will assist with educating employees on the importance of safe work practices, project life cycles, code requirements, customer interaction, and data collection and documentation. Existing workforce training methods were assessed before making program enhancements, which enhancements can include changing the core training curriculum, increasing human performance fundamentals, increasing hands-on evaluations, improving training facilities, and increasing the number of training personnel.

Program Metrics

Having employees performing their duties on the job with a higher level of training should lead to fewer instances of leaks caused by incorrect operations. The baseline for measuring the effectiveness of the overall program will be the leakage rate on a rolling 7 years of leaks caused by incorrect operations in Ohio. The graph below shows a trending decrease in leaks caused by

incorrect operations and is attributed to a more robust training program. In addition, there was an abrupt increase in the number of incorrect operations leaks from 2010 through 2013. This increase is attributed to the start of the Distribution Integrity Management Program's effort to improve leak reporting. A negative leak rate is desirable for this metric and the Company expects to see a continuing decreasing rate and in 2018 Duke Energy Ohio experienced a drop in incorrect operations leak driven mainly by a large decrease in leaks on threaded joints.

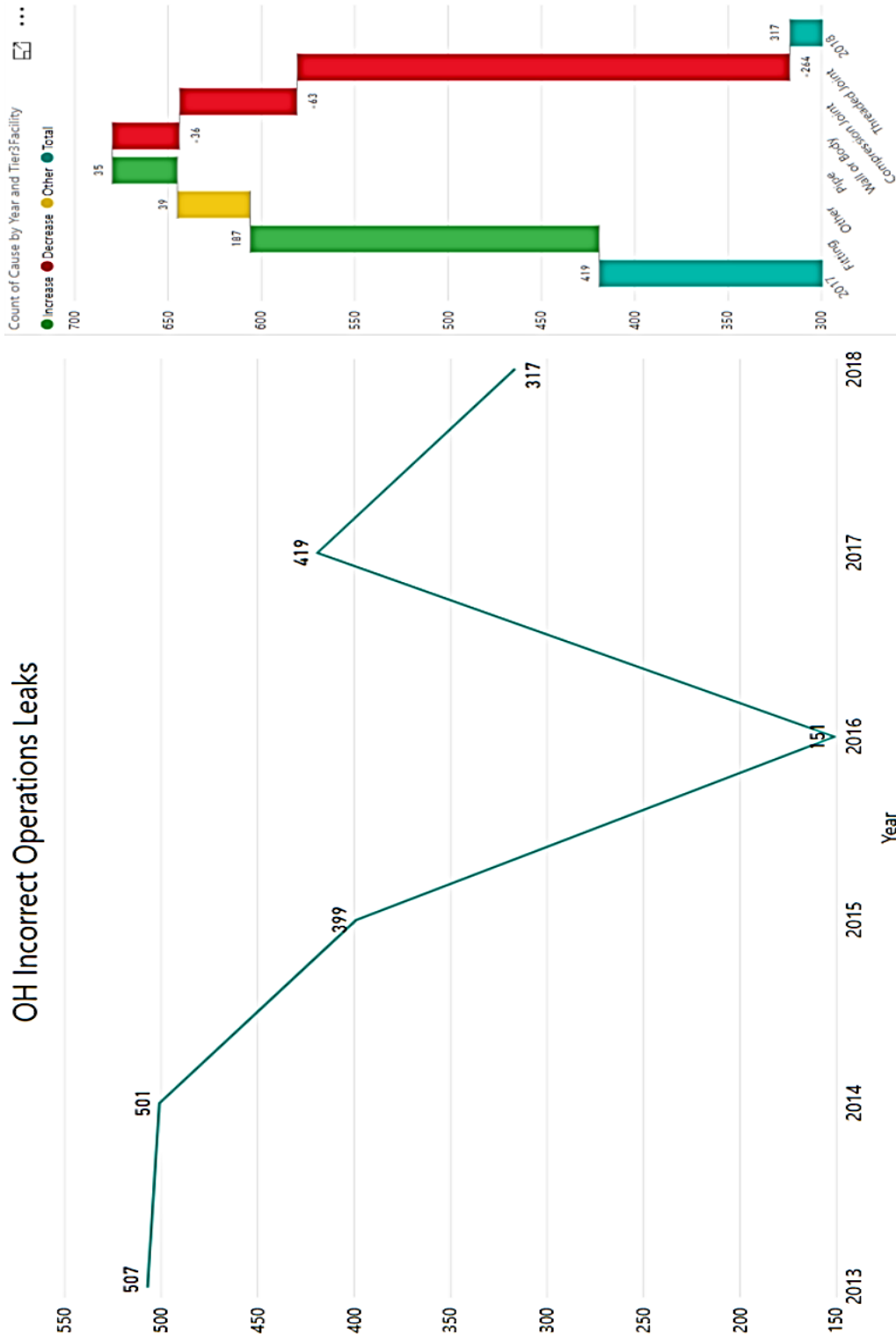


Figure 5: Total Ohio Incorrect Operations Leaks by Year

Training Curriculum Project

Learning Services teaches classes for Mechanics, Mechanic Operators, Inspecting Mechanics, Meter Specialists, and Service Mechanics. This work is complete; however, there are several more small projects for updating training facilities and curriculum that will be tracked under this project code in coming years.

The goal of proper training is to instruct employees on the correct procedures for installation and maintenance of gas facilities.

History

Since the start of DIMP in 2012, Duke Energy Ohio has been trying to identify the organizational issues that contribute to risk for the gas distribution system. The issue of training was identified early on by analysis of data that was coming in as a result of DIMP. It was determined that an insufficient training program can lead to a host of issues such as poor workmanship, poor completion of required documentation, and insufficient knowledge in emergency response. Those issues contribute not only to risk in the field but also the analysis of risk by the DIMP group. In order to meet the requirements of a strong DIMP program, Duke Energy Ohio has determined its training program will be more comprehensive with more learning tools available for educating employees about what they may have to deal with as front line workers.

Goal

The goal of the training curriculum project is to provide field employees educational opportunities related to proper principles and practices of performing sound operations and maintenance to Duke Energy Ohio's pipelines.

Scope

Improvements were made to the core curriculum for craft employees to increase focus on human performance fundamentals and hands-on evaluations. Improvements were also made to the training facility.

Timeline

As new projects are added they will have established timelines in this section.

Metrics

Metrics around the training curriculum projects are divided into two categories. The first category is how many new projects have been initiated by year and the second is the passing rate of field employees on training.

Training Curriculum Project Metric 1 – New Training Projects Added by Year

This metric keeps track of how many new and/or improved initiatives are developed by training staff to better educate and train field employees by year. Training provides field employees with competencies in a shorter amount of time than experience in a real world situations. In addition, some real world situations may be hazardous so, if employees can

be trained in a safe environment, they can gain experience in that situation without being exposed to danger. Duke Energy Ohio expects to add at least one project a year to the original project. New projects provide a direct benefit to public safety by ensuring Duke Energy Ohio has a highly trained and fully competent staff.

Year	Training Project	Description
2017	CIP 1 Training	Duke Energy in partnership with BTS (Contractor), hosted a NACE CIP 1 certification course.
2017	Pig Launcher/Receiver Training	A small scale pig launcher/receiver was built to educate employees on how to properly use. The apparatus uses compressed air to demonstrate functionality. (See Figure 5 below)
2018	Excavator Simulator	See the excavator simulator section of this document for details.
2019		
2020		

Table 5: Additional Training Projects Added by Year



Figure 6: Pig launcher/receiver training apparatus

Training Curriculum Project Metric 2 – Passing Rate of Training

The performance of the training curriculum project will be measured based on the passing rate of the field employees. The table below illustrates the passing rate for training new employees.

Year	Passing Rate
2017	100%
2018	100%
2019	
2020	

Table 6: Passing Rate of Training by Year

Safety Impact

The training program is designed to impact safety by ensuring that Duke Energy Ohio's field employees are confident and experienced in dealing with situations they encounter in the field. Properly trained employees will possess enhanced abilities to assess situations dealing with leaking gas and take appropriate actions to save life and property. In addition, a soundly trained workforce will be able to provide more consistent and complete information to the integrity management programs that rank risk and establish programs to address risk.

Backhoe Simulator



History

The backhoe simulator was purchased March 28, 2018 from an Ohio equipment dealer.

Goal

The goal of the backhoe simulator is to give field personnel hands on experience on a backhoe without being placed in danger. This simulator gives the user a multitude of digging scenarios without having to leave the shop. This added experience will give Duke Energy Ohio Employees of what can go wrong while excavating and what actions

to take to avoid them. Therefore, the goal of the program is to reduce damages caused by First Party and Second Party Contractors.

Scope

The scope of this project includes 1 simulator and is open to all Duke Energy employees that operate heavy equipment.

Timeline

The simulator was purchased in 2018 with expected delivery pushed back to 2019.

Metrics

Duke employees and contractors will be able to utilize the simulator. The goal of the simulator is to reduce damages caused by company employees and our contractors. First party damages are very rare for Duke Energy OH so the metric utilized will be damages caused by Duke Energy OH contractors. Currently the count of damages has been trending down over the last six years. Duke energy will continue to use a six year rolling average and expects to see further decrease in the amount of damages caused by our contractors once the simulator is being used.

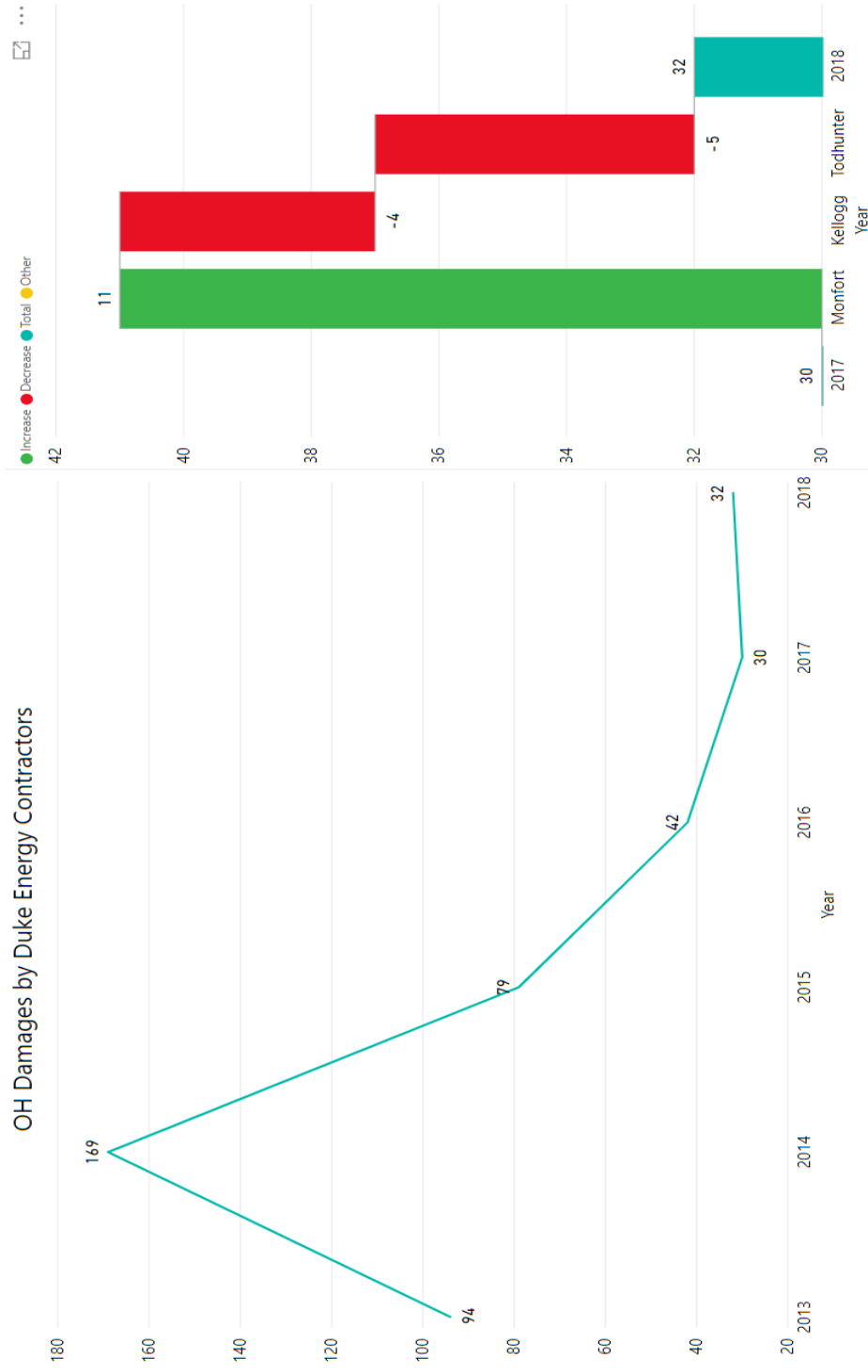


Figure 7: Damages caused by Duke Energy Contractors in OH

Safety Impact

Having highly trained employees provides a direct benefit to the public by ensuring Duke Energy field crews have had hands on experience with many scenarios of possible issues that can happen while operating heavy equipment. This experience allows employees to anticipate what will go wrong in the field and how to minimize the impact to the public if something should go wrong.

DIMP – DAMAGE PREVENTION

Excavation damages are the largest risk to Duke Energy's natural gas facilities. This program will add damage claims investigators, improve records access to locate companies, and decrease unlocatable facilities by correcting the root cause of the problems.

The goal of the Damage Prevention Program is to keep damages from happening before they occur. Duke Energy Ohio classifies excavation damages as hazardous leaks, which are defined as an immediate danger to life and property. For every damage prevented with the damage prevention program, this danger is avoided.

Program Metrics

The performance of the overall damage prevention program will be evaluated at high level on the metric of damages per thousand locates. This metric takes in many factors and can be influenced by two different mechanisms. The number can be decreased either by increasing excavation one call tickets or by reducing damages. Both are influenced by individual projects in the damage prevention program. The baseline for this metric will be based on a rolling 7 years of data and a decrease in the rate of damages per thousand locates is the desired outcome. Currently, damages per thousand locates are trending down by an average rate of -0.89 damage per 1000 tickets per year, which is an improvement of the previous -0.63 damages per 1,000 tickets per year. Using a rolling 7 years of data will drive continuous improvement and a yearly rate at or under the rolling 7-year baseline is expected. The chart below shows the historical damages per thousand locates for Duke Energy Ohio with the baseline trend.

The steady drop continued in 2018 down to 3.4 damages per thousand locates. Using the predictive analytics built in to Power BI, we are able to estimate a possible range with 99% confidence that the damage rate should drop below 2.7. This is entirely based on past performance.

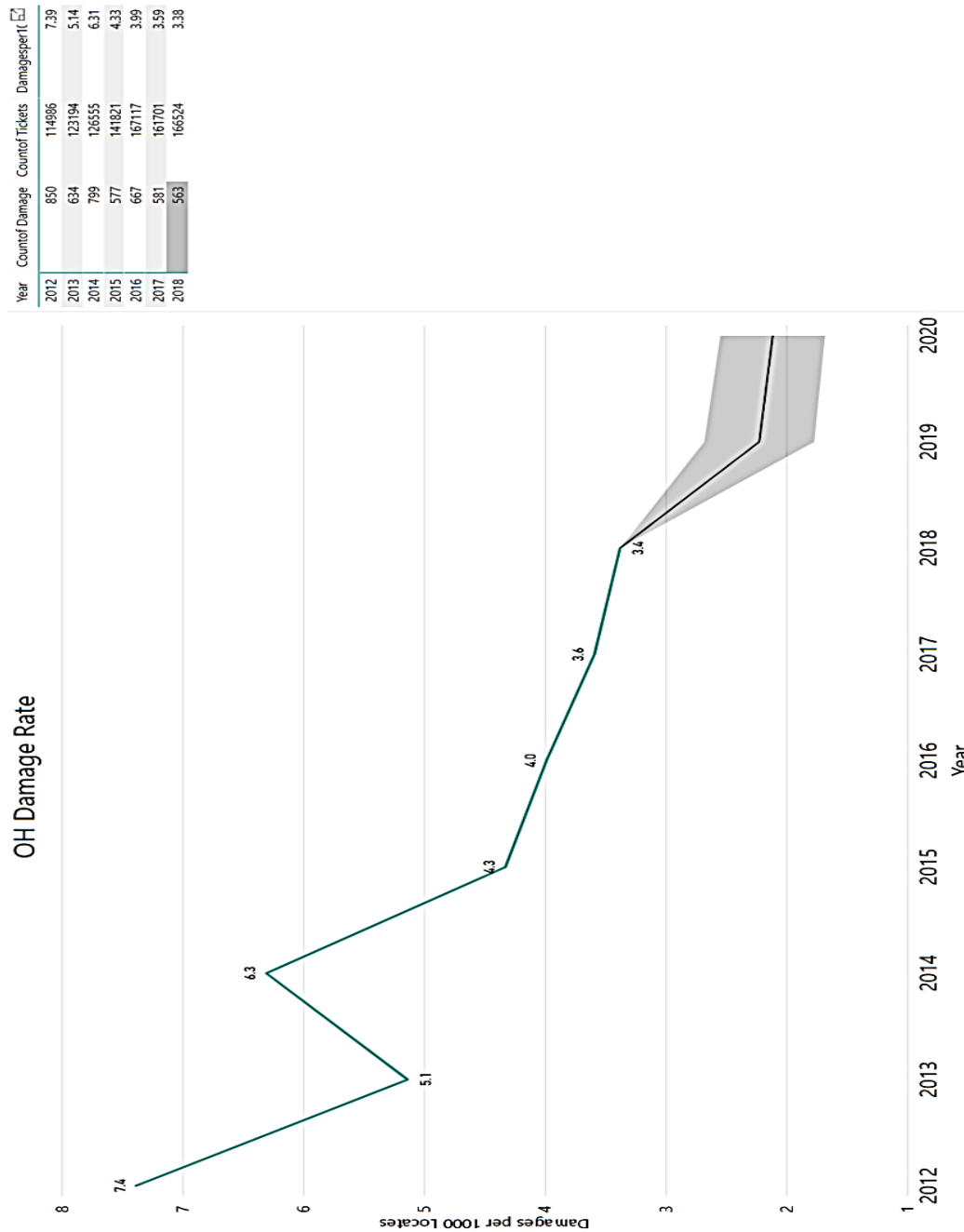


Figure 8: Ohio Rate of Damages per 1000 Tickets by Year

Radio Ads / Mailings / Training Videos Project

The work performed under this project include various means of reaching out to Duke Energy Ohio costumers to increase Public Awareness of Duke Energy's gas distribution system.

History

Public awareness and the understanding of pipeline operations are vital to the continued safe operation of pipelines. On December 17, 2002, the President of the United States of America signed into law the Pipeline Safety Improvement Act (PSIA)¹ that required an owner or operator of a gas or hazardous liquid pipeline facility to take action to improve its public education program and allowed the Secretary of the U.S. Department of Transportation to issue standards prescribing the elements of an effective public education program. In response, the Office of Pipeline Safety (OPS) promulgated regulations that revised 49 CFR Parts 192.616 and 195.440 and incorporated by reference the American Petroleum Institute's (API) Recommended Practice (RP) 1162, "Public Awareness Program for Pipeline Operators." The regulation states in part that the Company must develop and implement a written continuing public education program that follows the guidance provided in RP 1162.

Goal

The goals of the radio ads / mailings / training videos project are:

1. Educating the public, appropriate government organizations, and persons engaged in excavation related activities on:
 - a. Use of the 811 one-call notification system (Call Before You Dig) prior to excavation and other activities that might damage lines;
 - b. Possible hazards associated with unintended releases from a natural gas or hazardous liquid pipeline facility;
 - c. Physical indications that such a release may have occurred;
 - d. Steps that should be taken for public safety in the event of a natural gas or hazardous liquid pipeline release; and
 - e. Procedures to report such an event.
2. Advising affected municipalities, school districts, businesses, and residents of buried natural gas or hazardous liquid pipeline facility locations and an effort to raise stakeholder awareness of the presence of pipelines in the communities we serve.
3. Use media that is as comprehensive as necessary to reach all areas in which Duke Energy Ohio transports natural gas.
4. Conduct the program in English and in other languages commonly understood by a significant number and concentration of the non-English speaking population in the area of Duke Energy Ohio pipelines.
5. Educate stakeholders on how to recognize potential leaks of all kinds near pipelines owned by Duke Energy Ohio and what to do if a leak is recognized. This would include any natural gas pipelines and pipelines carrying hazardous liquids, liquefied natural gas and propane. Note: Duke Energy Ohio does not operate any hazardous liquids, liquefied natural gas or propane pipelines at this time.

6. Raise stakeholder awareness of the necessity to Call Before You Dig/Call 811 and take other damage prevention actions when conducting any kind of excavation work or landscaping.
7. Help excavators understand the steps that they should take to prevent damage to the pipeline and respond properly if the pipeline is damaged.
8. Help emergency response agencies and first responders understand the proper actions to take in response to a pipeline emergency.
9. Maintain this written Public Awareness Plan (PAP) that provides a continuing public education program that follows the general program recommendations of API RP1162.
10. Assess the unique attributes and characteristics of the Duke Energy Ohio pipelines and facilities.

Scope

This project varies in scope based on the needs of the Company. At a minimum it involves Duke Energy Ohio's Health & Safety group using local media outlets to provide communications to the public. An example of such a communication is show below and was an actual advertisement displayed in 2017:



Figure 9: Image of billboard in Duke Energy Ohio operating territory

Timeline

This project was started during the fourth quarter of 2017 and will be ramped up in 2018. Project will be ongoing.

Metrics

The metric for the radio ads / mailings / training videos will show how many of each were utilized by year. The more customers and general public Duke Energy Ohio can reach to

provide information on the one call law, the higher the benefit to the public by ensuring they know the law and have their facilities located before digging.

Radio Ad / Mailings / Training Videos Project Metric 1 – Number of Radio Ads by Year

Radio advertisements are designed to reach the public to inform them of the one call law and the safety benefits of calling before you dig. Radio ads have not been done since 2010. The intent is to bring back radio advertising. Once radio advertising is started, a baseline will be established based on the number of times the advertisements run and several key performance indicators generated by the advertising campaign.

Year	Station	Spots	Total Spots
2017	WEBN-FM	184	677
	WKFS-FM	184	
	WLW_AM	309	
2018	WFTKFM	280	1696
	WGRRFM	262	
	WIZFFM	266	
	WKRCAM	21	
	WKRQFM	247	
	WLW AM	196	
	WRRMFM	228	
	WUBEFM	196	

Table 7: Radio Ads by Year

Radio Ad / Mailings / Training Videos Project Metric 2 – Number of Mailings by Year

Mailings are designed to be a direct communication channel between Duke Energy Ohio and our customers, to inform them about the one call law and safe digging practices. The baseline for this metric and the performance is based on the number of mailers sent out. A year-to-year increase in the number of mailers is desired. The table below shows the number of mailers sent by date.

Year	Number of Mailers
2017	480,000
2018	1,200,000

2019	
2020	

Table 8: Mailings Sent Out by Year

Radio Ad / Mailings / Training Videos Metric 3 – Number of Training Videos by Year

Duke Energy Ohio will advertise on its website videos on the importance of calling 811 and safe digging. We are also planning on getting involved in a national safe digging campaign with a well-known television celebrity. Metrics are yet to be determined.

Radio Ad / Mailings / Training Videos Metric 4 – Number of Third-Party Damages

Since this project is designed to reach third parties that are excavating around our pipeline, the most important metric is a reduction in third-party damages. If third-party damages are being reduced, there is a direct impact on the safety of the public. A baseline of the rate of damages of a rolling 7 years of data will be used to measure the effectiveness of the program. Currently, the trend is flat or just slightly negative. A negative rate is desirable and Duke Energy Ohio expects to see the rate decrease under -10 or more negative as a result of this project. In 2017 the actual number of third party damages dropped below the rate on the trend line, which indicates improvement. For 2018, the metrics have been updated to include all damages. The use of a more sophisticated analytical tool enables Duke Energy to analyze the underlying trends in the data. The chart below shows that the Todhunter and Kellogg districts had the greatest decrease in damages while Monfort experienced an increase. Going forward, Duke Energy can target advertising in this area if it continues to show increases. Furthermore, damages associated with failure to call experienced a decrease from 2017 to 2018.

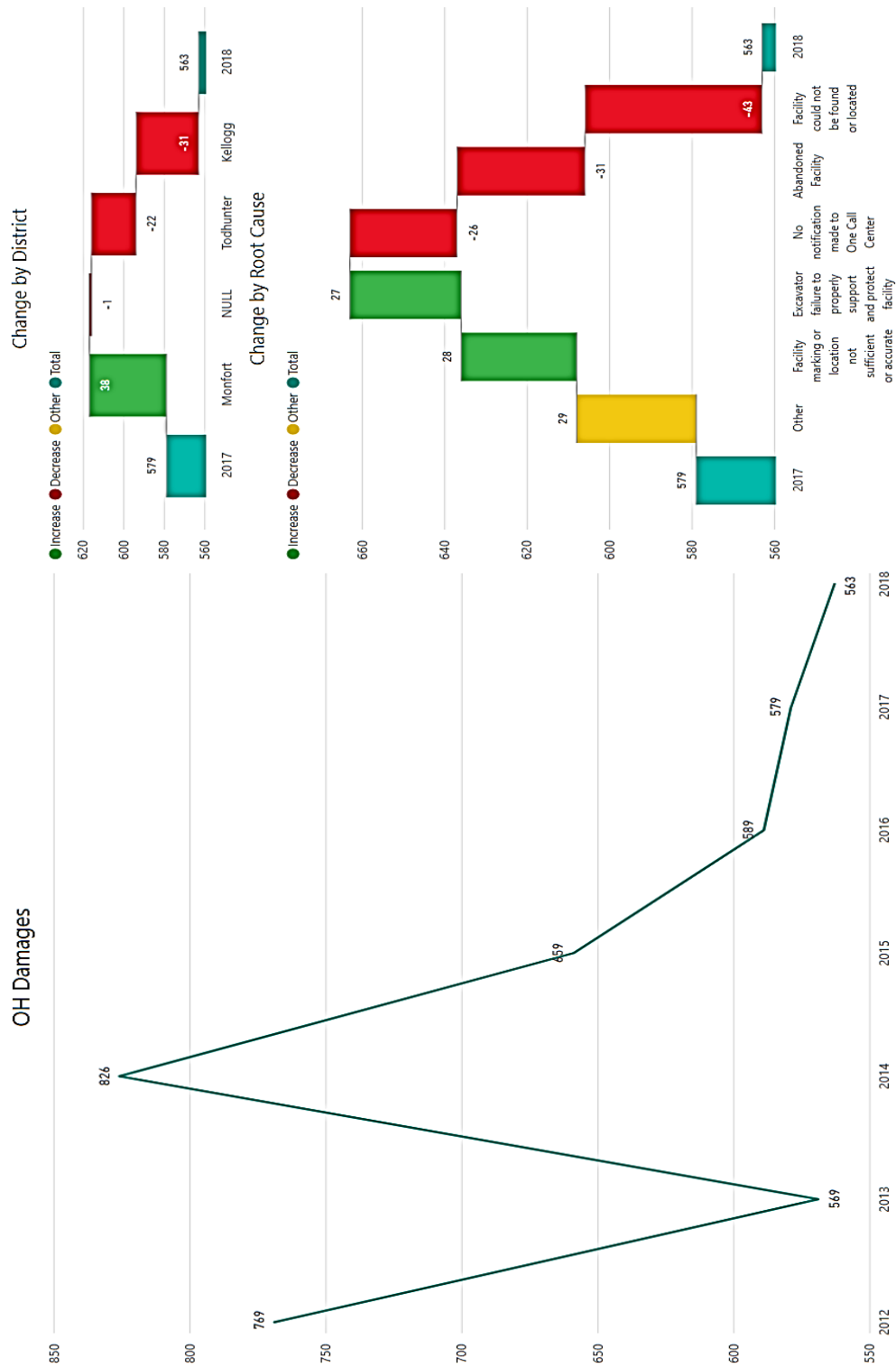


Figure 10: Ohio Damages by by Year

Safety Intent

This project is intended to improve safety by creating more awareness by customers, contractors and the general public about the one call law. Excavation damages are Duke Energy Ohio's greatest contributor to risk. An increased use of the one call system by all parties will improve the safety of not only the excavator/homeowner, but also everyone else in the general area. Any damage prevented has a direct impact to public safety.

GIS-Based Leak Survey / Line Patrol Records

A leak survey program is a requirement under CFR 49 192.723. The code prescribes maximum intervals between an operator's performance of leak surveys, based on the location of a pipeline. Proper leak surveys are a critical piece of any operations and maintenance program because they allow gas operators to find leaks expeditiously, and to place them on a schedule for repair or repair them immediately. In addition to being a code requirement, a leak survey program provides a safety benefit to the public by being proactive in finding and fixing leaks.

History

This project replaced a manual tracking method for leak surveys and line patrols that used a Microsoft Access database and paper gas maps. The new program uses the Inspection & Survey module for myWorld, developed by Ubisense. Duke Energy Ohio seeks to eliminate stand-alone access databases and incorporate them into the GIS system of record.

Goal

The goal of this project is to eliminate manual tracking methods for leak surveys as well as the access database where they are stored and replace them with a more automated process that ties into our GIS system of record. The equipment uses GPS tracking to track leak surveyors as they perform their work. This provides Duke Energy Ohio and the public the verification that a leak survey has taken place. This process should free some company employees to perform other work for our customers that would have been previously associated with doing work in the tracking database.

Scope

Leak survey/line patrol orders are automatically generated from myWorld and sent to handheld GPS enabled devices that breadcrumb track the work as the surveys are being performed. These devices forward the data to a central server database where it will be made available through dashboards to office personnel for reporting, monitoring, and editing. Once implemented, the Inspection & Survey solution will increase data integrity and accuracy related to Leak Survey and Line Patrol inspections. It should also reduce the required number personnel to manage this work.

Timeline

The solution is approximately 40% complete. It was being tested in 2017 and was deployed in 2018.

Metrics

The metric to measure the effectiveness of the Leak Survey / Line Patrol Records project will be leaks found on leak surveys in Ohio. The baseline will be determined on a 7-year rolling average. Due to the fact that this project increases employee accountability and improves accuracy, there may be a temporary increase in the number of leaks found by leak surveys but, over time, the number of leaks should decrease. This metric is currently under development.

Safety Intent

Proactive leak detection is not only a code requirement but also an essential program to address risk. Early detection of leaks provides Duke Energy Ohio the ability to immediately fix a leak or place it on a schedule for repair. Adding the GPS component provides quality assurance to Duke Energy Ohio and its customers by being able to plot where a leak survey technician has been and what the readings were at each point. This plotting technique, known as “breadcrumbing,” displays a visual trace of the entire survey to ensure that no locations were left uninspected. This program is intended to ensure the entire system is leak surveyed as required in our procedure.

Untoneable Investigations and Repairs on Mains & Services

History

This project was instituted as an audit of our existing 811-locate company to make sure they were putting forth a good effort to locate gas facilities. Tickets turned in as unlocatable/untoneable by the 811-locate company were given to a third-party vendor to verify whether the gas facility was truly unlocatable/untoneable. As part of this investigation project, action had to be taken to correct untoneable issues found on mains and services. If this corrective action had not been taken, pipeline facilities would have been left unlocatable and would pose a risk to the public by having a higher likelihood of being the cause of excavation damage.

Goal

The goal of this project is to find the locations where our facilities cannot be located and perform corrective action to make sure they can be located in the future. In addition, the goal is to ensure compliance with CFR 49 192.321(e), which specifies that plastic pipe must be locatable.

Scope

The scope of this project includes all mains and services across Duke Energy Ohio’s service territory that cannot be located with standard locate equipment. This project is broken out into two areas. The untoneable portion of this project involves any facility that Duke Energy Ohio or our locate contractor cannot locate as part of a locate request. The untraceable portion is only on the mains and services installed during Duke Energy Ohio’s

accelerated main replacement program and is used as a quality assurance check to ensure our facilities were installed correctly.

Timeline

This project was initiated near the end of 2016 and is expected to take 12 years to complete based on current volume of work.

Metrics

Metrics for the untoneable / untraceable project were changed in 2018 due to the fact that the program has changed from the original reinspection of untoneable tickets to reinspection and repair of those facilities. The purpose of this program is to ensure that our facilities can be located in the future. Therefore, the metrics going forward will be the percent and count of untoneable facilities that were repaired. A goal of 100% for every year is desirable. Metrics for 2018 are limited because the project began towards the end of the year.

Untoneable Investigations and Repairs on Mains & Services Project Metric 1 –

Mains

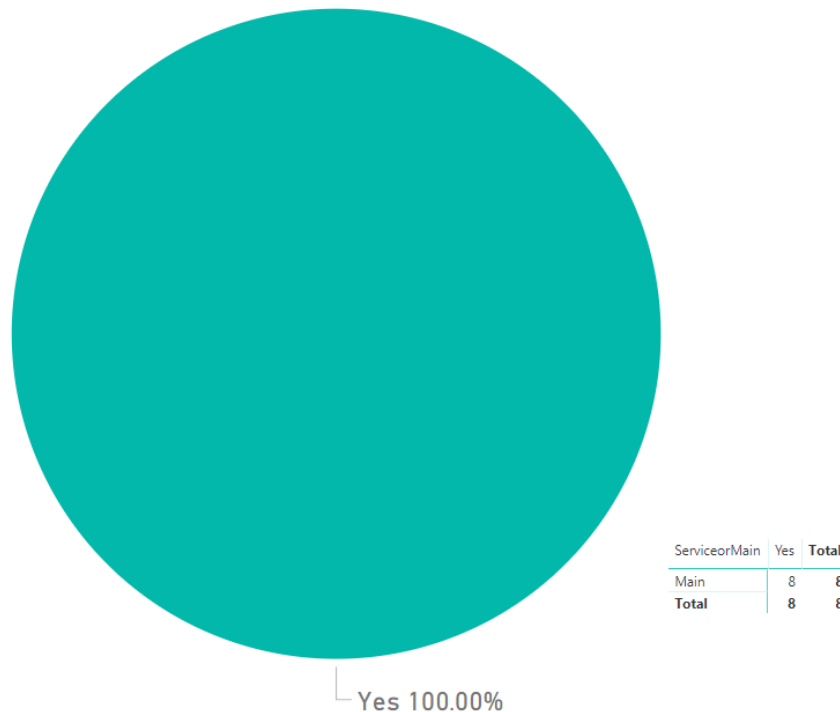


Table 9: Percent of Untoneable Mains Repaired 2018

Untoneable Investigations and Repairs on Mains & Services Project Metric 2 – Services

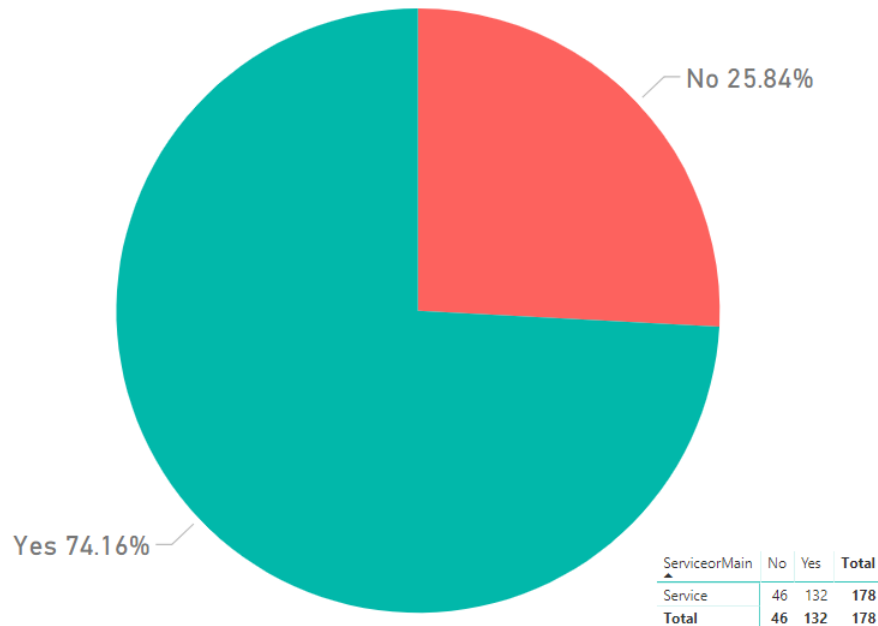


Table 10: Percent of Distribution Services Repaired 2018

Note: The facilities that were not repaired in 2018 are scheduled to be repaired in 2019.

Safety Intent

This program is intended to improve safety by ensuring that all gas facilities are locatable. The majority of excavation damages occur on services and this project targets services. Due to the fact that services are generally closer to a structure than mains, not having a locatable service increases the chances for an excavation close to a structure, which creates an immediate risk to life and property.

Watch and Protect

Duke Energy Watch and Protect Program (W&P) utilizes inspectors and output from Optimain xDR ticket risk ranking, to ensure that excavators are complying with the rules and regulations of the State of Ohio and Duke Energy Ohio regarding work performed within a designated area of the Duke Energy natural gas system to prevent and reduce excavation damages to the system. The W&P Program is designed to protect the natural gas system by preventing excavation damages caused by excavators and their equipment; identify improper excavation activities; educate contractors on the requirements of the Ohio Safe Digging regulations and violations of the law.

History

The W&P program is a new program developed by Duke Energy Ohio. It is similar to and has been modeled after programs being run by other natural gas operators across the country and in the state of Ohio. Historically, other operators have experienced approximately 30% drops in the count of damages and their damage rates. Duke Energy Ohio expects to have similar results by performing the W&P program.

Scope

The scope of work includes all tasks necessary to complete and record visits to contractors and or excavation sites as determined through Optimain xDR risk ranking software. Inspectors will travel daily throughout designated Duke Energy territories, within Ohio only, to ensure excavator contractors are adhering to Ohio regulations regarding safe excavation practices; conversing with excavators and other contractors to determine if there are any concerns or issues regarding the mark out or underground facility location; notification to Duke Energy if there are any immediate concerns; and advise excavator contractor and or other contractors to contact Ohio Utilities Protection Service (OUPS) or Duke Energy for re-marks and clarification.

Inspectors will receive a daily or weekly record of excavation work being performed via the Opvantek Optimain xDR program on a format to be viewed on equipment such as a tablet or smart phone.

Inspectors will visit sites during active construction, weather permitting. Inspectors may be directed to visit proposed work sites to ensure excavation is not occurring before the required wait time.

The inspector will have the option, with the direction of Duke Energy, to contact excavator contractors via telephone or visits to the contractor's office location to discuss any excavation issues or concerns. However, unless directed otherwise by Duke Energy, site visits are the preferred method of contact.

The inspector will also be conscious of any excavation activity not associated with the identified locations received from Duke Energy i.e. no evidence of an underground facility mark out. The inspector will inquire of the excavator contractor if there has been a request made for a mark out, and if not, advise the excavator contractor to stop work and request a mark out. The inspector will immediately notify Duke Energy of conditions found.

Inspectors may be directed by Duke Energy to standby at designated work sites or excavations based on the excavator contractor's rating in Optimain xDR and or the critical nature of the facility in the vicinity of the excavation i.e. high consequence areas. (These may be HCA's; excavation around schools or hospitals; high pressure or transmission mains; or to observe high risk contractors)

Inspectors may be required to revisit an excavator contractor or work site during the day based on risk of excavation activity location or excavator contractor history.

The W&P contractor supervisor and a designated representative from Duke Energy will communicate weekly and review the previous week's activities and any issues or concerns.

Timeline

This program will be ongoing in conjunction with Optimain xDR.

Metrics

Metrics will measure the desired output of this program, which is an improvement on damages per 1000 locates and reduced damages from excavators not using proper precaution in the tolerance zone. A rolling trend of 5 years will be utilized for evaluation and a downward trend on both is desirable.

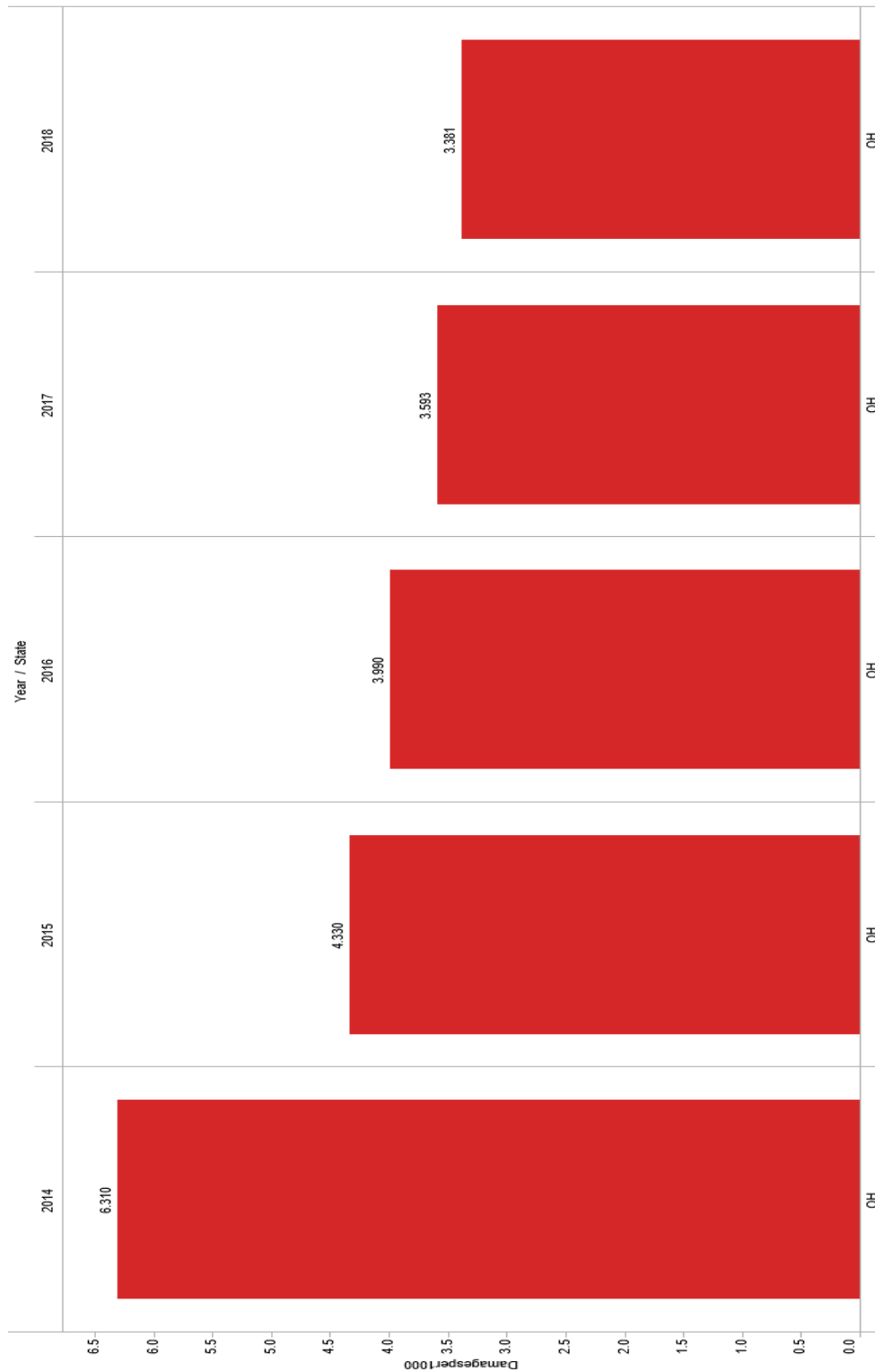


Figure 11: Ohio Damages per 1000 Locates

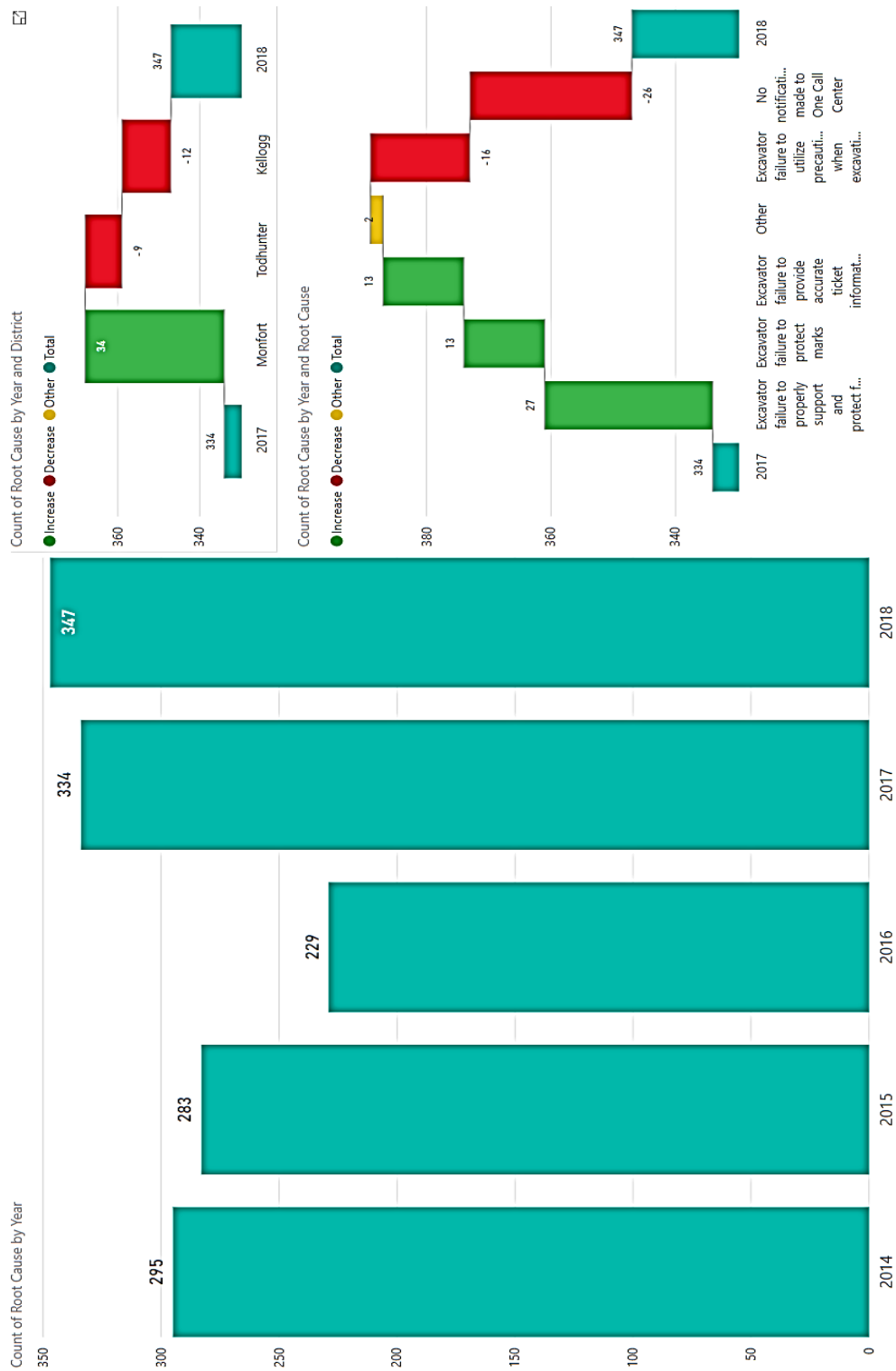


Figure 12: Count of Third Party Damages

The chart shows an upward trend over the last three years in third party damages. The largest increase from 2017 to 2018 came from excavators' failure to properly support and protect facilities while the largest drop year over year was in damages caused by failure to utilize one call center. Duke Energy Ohio expects to see downward movement in the total numbers as the program moves forward.

Safety Intent

Hitting a natural gas pipeline has serious consequences. Even a tiny gouge, scrape, dent or crease to a gas pipe or its coating may cause a leak that could lead to a catastrophic fire or explosion. Duke Energy Ohio's greatest risk to the distribution system has consistently been excavation damage for years. By being proactive and communicating with excavators on high risk tickets, Duke Energy Ohio can provide a greater safety benefit to excavators and the general public.

TIMP - MAOP VERIFICATION

This program consists of contractor help to perform a thorough, segment-by-segment review of pipelines operating above or near 20% SMYS (Specified Maximum Yield Strength) to verify the completeness and traceability of data, in order to support and establish pipeline maximum allowable operating pressures (MAOP). As as-builts are being reviewed, pipeline features and other information are added, validated, and updated in our GIS system (Smallworld) that will aid in determining the MAOP of pipe line segments. This initiative also includes integrating new software for calculating line MAOPs with our GIS system. The MAOP calculator pulls information from the GIS system (Smallworld).

Improving our MAOP data allows Duke Energy Ohio to perform detailed threat and risk analyses that integrate accurate data and information from the Company's entire pipeline system. These risk analyses are used in the identification of appropriate assessment methods, and preventive and mitigative measures.

Program Metrics

To be determined.

MAOP Verification

Verification of the MAOP of transmission pipelines allows Duke Energy Ohio to safely operate at pressures required to serve our customers. This project improves the safety of our customers by ensuring that our records are correct to operate as needed. Incomplete records can lead to events such as the incident in San Bruno, CA.

History

Prior to 1985, Duke Energy Ohio did not have a consistent, centralized location to store MAOP information. The need for this was recognized, which resulted in the creation of the MAOP electronic database. The effort of completing the work required to update and verify all system components was originally estimated to take 4 years. As a result of

document research, 46 lines and 105 system stations were determined to have incomplete records. In addition, Duke Energy Ohio recognized the need to find pressure records for 5 years preceding 1970 to establish MAOP per 49 CFR 192.619(a)(3). Job completion processes were also modified to have a final review by engineering, as opposed to being closed out in the individual districts. This process adjustment created a final check and balance to the required MAOP documentation.

A series of laws came into effect that had implications for operators of transmission lines. These laws include the following:

- Accountable Pipeline Safety and Partnership Act of 1996
- PHMSA publishes integrity management regulations for hazardous liquid pipelines in 2000
- Final Rule for Pipeline Integrity Management in High Consequence Areas published in 2004
- Pipeline Inspection, Protection, Enforcement and Safety Act of 2006
- Pipeline Safety, Regulatory Certainty and Job Creation Act of 2011

As a result of these laws and their intent to increase the level of safety to the public, Duke Energy Ohio has determined that it must take action to have the most up to date and complete transmission records possible to safely serve our customers.

Goal

The goal of this project is to ensure we have the most complete and up to date records in our system of record to establish a more accurate MAOP. Requirements in CFR 49 Part 192.105(a) and 192.619(a)(1) specify that, if any pipe segment or pipeline asset that carries natural gas has unknown attributes, then the most conservative value must be used. Therefore, if a segment of transmission class has any unknown factor, it must be de-rated according to the code. Updating our current records with information that is pertinent to the calculation will allow Duke Energy to safely operate transmission pipelines at pressures required to serve our customers.

Scope

This project includes all pipelines that operate around or above 20% SMYS.

Timeline

This project was developed in conjunction with the MAOP calculator project to allow for better calculations from better information. As the MAOP calculator was being developed, it was discovered that several data points, necessary to the calculation of an accurate MAOP, were missing. This verification project is scheduled to be completed by the end of 2019.

Metrics - 2016

An Audit History Report from Smallworld shows that approximately 5,344 changes/additions were made to pipeline features in 2016 by the contingent employee currently working on this project. The baseline will be the average amount of each object modified over time. Duke Energy Ohio expects to see a rise in the rate of objects modified in the future, followed by a drop in the rate as work is completed.

Object Modified	Total
cap	31
coupling	23
elbow	674
flange	727
Flow control device	25
Line loop	82
main	1592
main catalog	33
Pipe change	212
reducer	757
sleeve	186
tee	386
valve	555
reg_sta_equipment	41
Regulator	18
Grand Total	5344

Table 80: Objects Modified in GIS

Metrics – 2017 and Beyond

The integrity management team began taking a closer look at the data contained in the MAOP database and determined that better information was available to represent the program goals. As stated in the goals section of this program, the intent of the MAOP verification program is to ensure the most up to date information is applied to the data in our system of record to be able to more accurately calculate the MAOP of a pipeline system. The data in the MAOP database was filtered for Ohio pipelines that had an MAOP verified by year. The data in the chart below shows a count of the segments of pipeline that were verified by year:

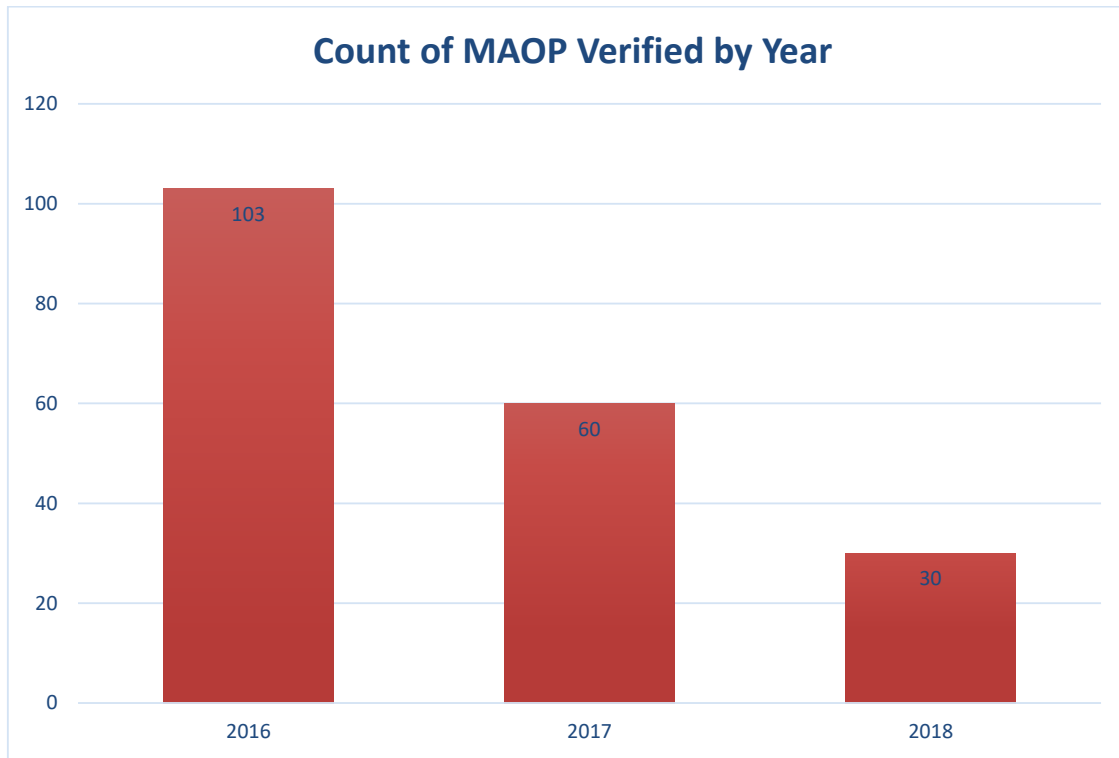


Figure 13: OH Pipeline Segments MAOP Verified

The chart shows an initial drop from 2016 to 2017. Integrity management expects to see a rise as work continues. The initial drop may be due to completion of work with specific pipeline systems and new systems starting work. Integrity Management will continue to closely monitor the metrics for the MAOP verification project.

Safety Intent

MAOP project improves the safety to the public by providing Duke Energy Ohio contractors and employees with a common source of verified pipeline components in our GIS. Having accurate records of pipeline components is essential when in an emergency situation and more information is required in order to make a good decision. In addition to emergency situations, this common repository of easily accessible information allows engineering, field operations, system operations, construction and other groups to be able to make more informed decisions that impact the scope of work they perform. Finally, this repository allows Duke Energy Ohio to comply with the requirement to keep records for the lifetime of the asset.

Midwest Data Cleanup (Data for MAOP Calculator) and Historic Pipeline Data Management (HPDM)

History

Duke Energy Gas Operations is required by US Code of Federal Regulations 49 CFR 192 to identify, manage and report the MAOP for each section of a gas pipeline or each segment of a gas distribution system. To meet this requirement Gas Operations uses a Microsoft Access database to perform and report these MAOP calculations. While this process meets federal regulations, it requires several Gas Engineering personnel nearly full time to manage. In addition, this Microsoft Access database is not integrated with Duke Energy's Smallworld platform (EGIS). This gap leads to data discrepancies that then in turn require large efforts across Gas Operations to correct.

In an effort to help gas utility companies and pipeline operators ensure safety through verifiable MAOP documentation, General Electric (GE) developed the MAOP Calculator. The Calculator, which was designed for integration into GE's Geospatial Information System called Smallworld, enables the calculation of MAOP for a line/loop of steel transmission pipelines for natural gas in a verifiable, traceable and complete method. The MAOP Calculator provides a completely customizable solution capable of performing extensive analysis, tracking and reporting on the data available via the connected GIS platform. In short, it provides a comprehensive solution to calculate the MAOP of any defined pipeline segment according to Pipeline and Hazardous Material Safety Administration (PHMSA) guidelines.

The MAOP calculator relies on complete records in the database to calculate an accurate MAOP for each pipeline segment. Therefore the project has shifted into a cleanup effort in order for the tool to be used effectively.

Goal

The project goal is to have a platform that can calculate MAOP on all transmission lines. This is intended to save time in the determination of MAOP so more time can be devoted to developing preventative and mitigative measures.

Scope

The Midwest Data Cleanup project includes all pipelines that operate at or above 20% SMYS. The HPDM project includes all pipelines under 20% SMYS. Running concurrently with this project, in an effort to provide better information for the calculator, Duke Energy will perform a gas materials cleanup in the GIS. The scope for this project includes:

- Historical Construction Document Review
 - Vendor will review all historical construction documents and identify applicable GIS information.
 - Work will be assigned and tracked through a Duke Energy SharePoint list.

- Documents will be accessed through corporate document management system based on work assignments.
- Types of documents for review include:
 - As-Built
 - Bill of Material
 - Completion File - Project Folder
 - Daily Reports
 - Green Book
 - Historic Gas Maps
 - Historic Standards
 - Historical Pipeline Purchases
 - Invoice
 - Job Control Forms (JCF)
 - Leak - PCR
 - MAOP Database - Access DB
 - Material Reconcile Report -CUs
 - MTRs
 - Permit
 - Photos
 - Pressure Test Charts
 - Pressure Test Report
 - Reel and Frame - JCF
 - Weld Sheets
 - X-Rays
- Update Duke Energy's Enterprise Smallworld GIS System
- Vendor will use identified historical construction information to perform GIS data updates and/or additions.
- Duke Energy will provide business rules to clarify when GIS updates and/or additions should be performed.
- GIS updates will be performed in a version controlled production Smallworld environment.
- Quality Control
 - Vendor will provide a quality control plan and procedure for identifying applicable GIS information from historical construction documents, and performing Smallworld GIS data updates and/or additions.
- Deliverables
 - Project plan
 - Quality control plan
 - GIS data updates and/or additions grouped by Duke Energy work assignments
 - Records split as indicated in project scope

Timeline

Release 1 of the MAOP Calculator project was completed in 2016. This work included implementation of the MAOP Calculator and another software package, Pipeline Integrity Data Manager (PIDM), produced by General Electric (GE). PIDM exports data from GE's GTO module of Smallworld for use in the MAOP calculator. Other work included data sync fixes between Smallworld's GDO module to its GTO module, minimal cleanup of the GDO catalog, and creation of a report export from the calculator to FileNet (document archive system). Releases 2 and 3 of this project include creating a web application that replaces the existing Microsoft Access MAOP and SR databases, creating an SQL server that centrally houses MAOP data for use in other applications, and developing reporting tools. Releases 2 and 3 of this project have been postponed until the integration plan with Piedmont Natural Gas is complete.

The Midwest Data Cleanup project began in March 2018 and is expected to be completed by mid 2019.

Metrics - Midwest Data Cleanup

Metrics for the Midwest Data Cleanup are how much of the total work has been completed. This percent of total of both lines and footage should increase every year.

Lines Completed	Total Lines	% of Total Lines	Footage Completed	Total Footage	% of Total Footage
37	53	69.8%	502,603	1,497,181	33.6%

Metrics – HPDM

TBD

Safety Intent

This project is intended to provide the public with a safe natural gas transmission system by using the information gathered by the MAOP verification project and running it through the calculator to establish MAOP on pipelines operating around or above 20% SMYS. This will identify areas on these pipelines where inadequate records or pipeline components exist and will require remediation such as replacement or more records searches to verify components. This calculator is designed to eliminate areas of risk to the public by ensuring the MAOP on the pipeline is appropriate and accurate.

C314 In-Line Inspection

As part of Duke Energy's commitment to pipeline safety, In-Line Inspection (ILI) has been adopted as the preferred method for performing transmission integrity assessments on pipelines when applicable.

History

A baseline assessment of Line C314 was initially conducted in 2014 by means of External Corrosion Direct Assessment (ECDA). However, due to the Company commitment towards ILI, Line C314 was chosen to be a candidate for ILI due to its ability to internally inspect the pipeline.

Scope

Line C314 is a 24-inch nominal diameter natural gas pipeline segment from Mason Road Station to WW Feed Station that operates in Northeast Cincinnati, Ohio. Details of the pipeline are as follows:

Line C314 Pipeline Attributes	
OD (inch):	24
Installation Year:	2003
MAOP [psi]:	720
Coating Type:	FBE
Wall Thickness (inch):	0.438, 0.500, and 0.625
Grade:	X52
Long Seam Type:	ERW
Total Miles:	10.69
HCA Mileage (miles):	7.15
Class 1 Areas (miles):	-
Class 2 Areas (miles):	-
Class 3 Areas (miles):	10.69

Timeline

In-line inspection will take place every 7 years in accordance with 192.939.

Metrics

Based on the Threat Analysis conducted on Line C314 in 2018, a high definition caliper and Magnetic Flux Leakage (MFL-A) tools with an Inertial Mapping Unit were selected to perform the integrity assessment. On June 13th and June 20th, 2018, an integrity assessment utilizing the afore mentioned ILI tools was successfully completed with no technical issues reported from the ILI tool vendor. A preliminary report was delivered to Duke Energy on August 13, 2018 and the final report was delivered on November 12, 2018. No response conditions per CFR 192.933 or ASME B31.8S were reported within either report.

In addition to the ILI assessment, a dent strain analysis was also performed and delivered on November 15, 2018 to identify any high strain or sharp dents, with no high strain or sharp dents reported. A Close Interval Survey (CIS) was also performed on the line to evaluate the Cathodic Protection (CP) and was overlaid with the ILI data to identify any

potential areas of concern within the CP. No significant areas of concern appeared to be present. Based upon analysis of the data integration, three (3) ILI validation digs were selected and are currently being performed to validate the ILI tool accuracy. Digs were initiated on May 1, 2019 and completion of the validation digs should be completed within the upcoming weeks. At this time the ILI Analysis of Line C314 is still ongoing and has not concluded to assign the next re-assessment.

- Pressure tests conducted for the Manufacturing threat can also detect some construction-related issues.
- Inspected per OM procedures
- ILI planned to assess the delayed failure mode of third party damage. Also managed via P&M measures.
- Managed via Preventative and Mitigative Measures.

Safety Intent

A proper in line inspection provides a safety benefit to the public by finding anomalies in the pipeline before they become a leak or rupture. These inspections give a detailed breakdown of all issues including pipe wall thickness and dents or gouges in the pipeline. These inspections drive where additional measures need to be taken because they give the exact locations on the pipeline where anomalies are found. The image below shows a typical anomaly found through ILI.

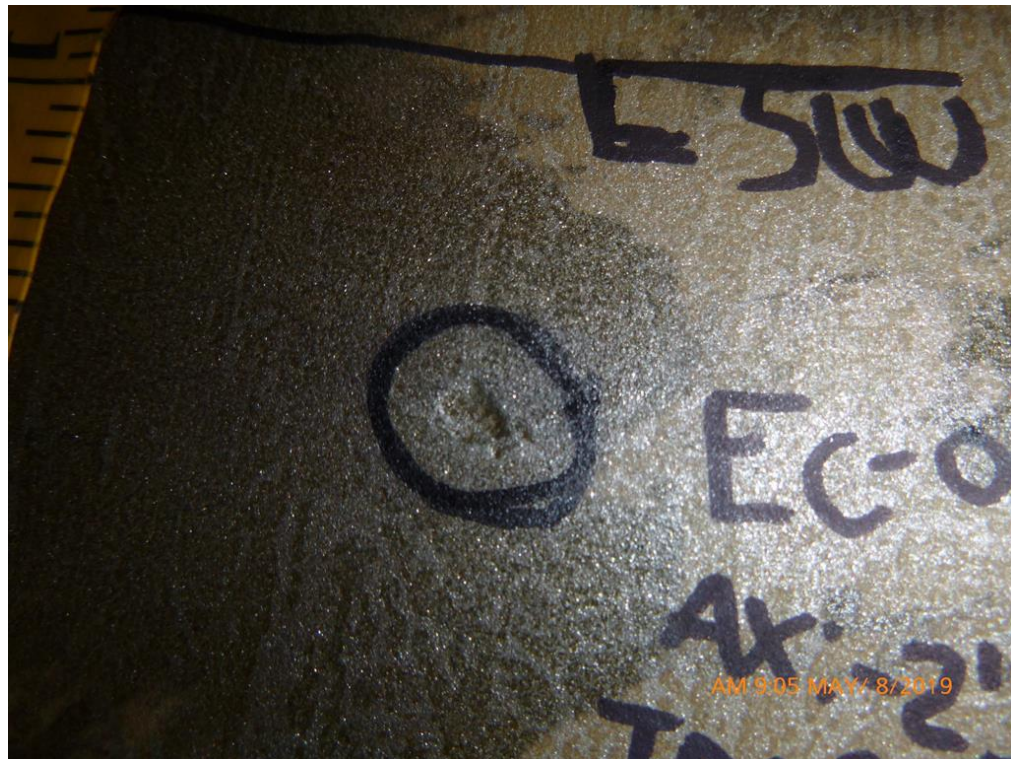


Figure 14: Anomaly Found on C314 and Selected for Validation

