TIME FOR CHANGE ENGINEERING

ROI: Return on INTEGRITY— Maximizing Value Through Proactive Corrosion Control Programs

Presented By : Cassandra K. Moody, M.S., P.E.

Introduction

- Nearly 20 years of industry experience
- Recovering pipeline operator
- Super power: prioritization
- Valve rule committee member
- Passion for next generation mentorship & encouraging women in the industry
- Hobbies: hiking, travel, cooking, reading

Cassandra K. Moody, M.S., P.E.
President + Principal Engineer
Time For Change Engineering

Agenda

1

ROI: Return On INTEGRITY Perspective

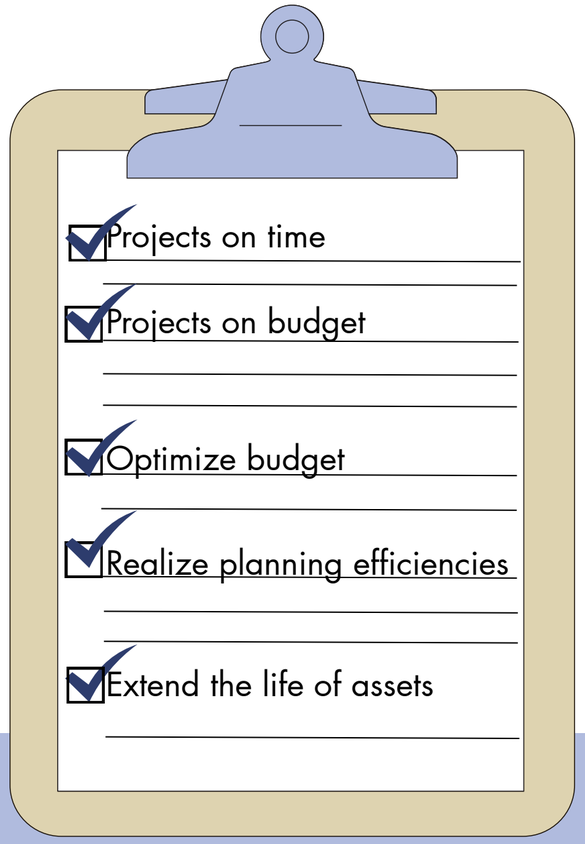
2

ADD Method

3

Corrosion Control Examples

Integrity = Investment



$$ROI = \frac{\text{(Gain from investment - Cost of investment)}}{\text{Cost of investment}}$$

ROI: Return On INTEGRITY

Common Problems During Corrosion Control Inspections

- Spacing between CP tests points is too large
- Interference currents not being handled properly
- Quality of records
  - Quality of field reports makes it difficult to demonstrate compliance with enhanced remediation requirements for transmission pipelines
  - Lack of proof of application of CP within one year of construction
- Struggle to account for IR drops on galvanic systems

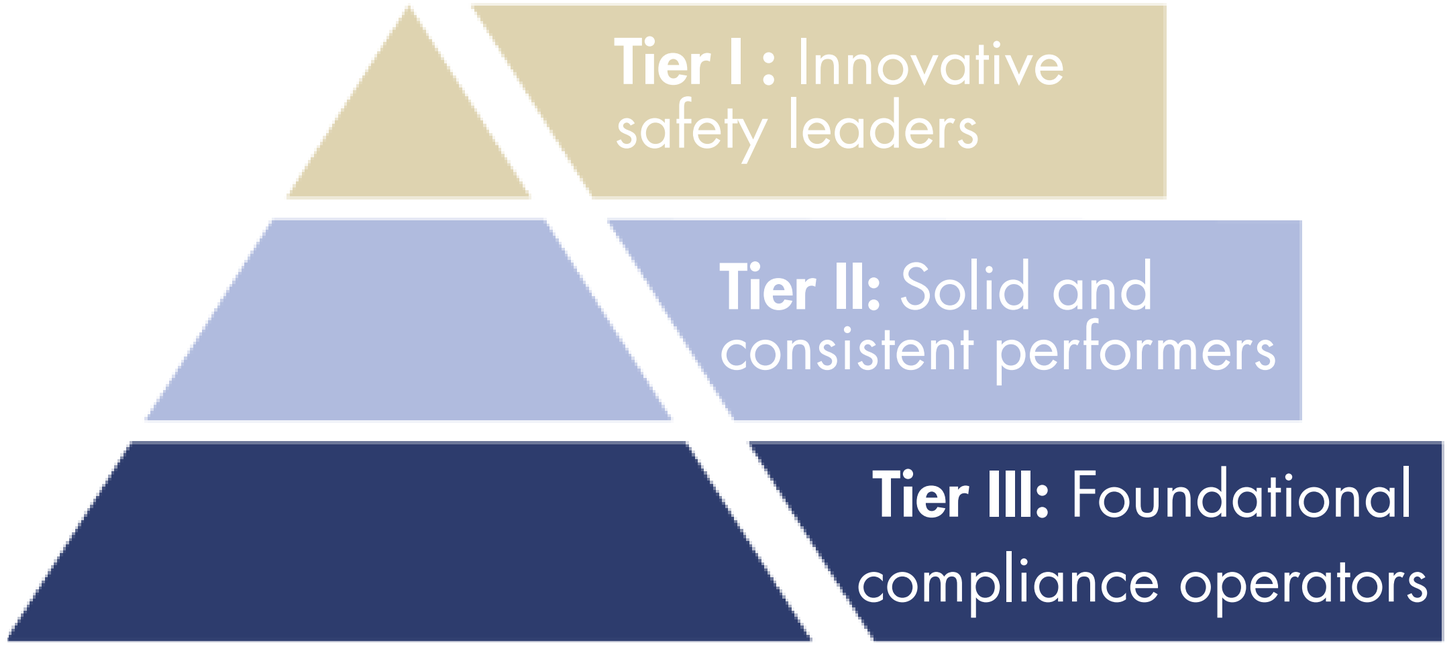
The best way to protect your systems is to have right-sized integrity management plans and prioritize risk-informed decision-making.

ADD Method

The ADD method ("Assess, Design, Do") is a simple way to assess and improve your integrity management program.

How can you use this method to improve your IMP?

Asset Integrity Assessment



Self Assessment

What is your tier?_____

Question	Tier III - 1 Point	Tier II - 2 Points	Tier I - 3 Points	Your score
What is the status of your company's procedures?	Basic code-regurgitation procedures saying "what"	Some written procedures without cross-references to other documents identifying "what" and maybe "who."	Comprehensive procedures stating "who, what where, when, why, and how" that cross-reference other documents, and are annually updated	
What is the status of your company's data records?	Records are incomplete. Data is siloed and unorganized	Records are decent and data is located in a single database	Records are in great shape, TVC accuracy, and well organized across the organization with visualization	
How many incidents has your company had in the last 3 years?	>5 incidents	1-4 incidents	0 incidents	
How many state and/or federal inspections has your company had in the last year?	<10 inspections	10-20 inspections	>21 inspections	
How many assessments (ILI, Hydro, etc.) does your company conduct per year on average?	<5 assessments	5-50 assessments	>51 assessments	
Which option best describes your company's risk management program?	SME qualitative program	Semi-Quantitative or QRA program	Comprehensive risk and threat management program with meaningful results and risk-informed decision making	
Which option best describes your company's training program?	Basic training	Moderate training with hands-on skills assessments	Industry-leading training and proactive table-top drills	
			Total points	

Note: This assessment is for informational purposes only, based on self-reported information and survey participants to date. It does not constitute regulatory or legal advise.

GRADING SCORE | TIER I : 15 - 21 | TIER II: 8-14 | TIER III: 1-7 |

TIME FOR CHANGE ENGINEERING
Safeguarding ROI: Return On INTEGRITY

Presented By : Time For Change, LLC.

Assess

- [x] Compile a list of all assets
- [ ] Identify, assess, and compile a list of the threats to each asset
- [ ] Identify the threat level of each asset
- [ ] Assess the risk of each asset
- [ ] Review current IMPs
- [ ] Analyze current trends in industry and regulatory notices
- [ ] Determine the need for any remediation activities, mitigative activities and/or any additional activities

Example Timeline of Assess Phase

ASSESS

Asset & threat identification

Risk analysis & prioritization of future activities

Review current IM Program/Plans

January

M	T	W	T	F	S	S
			1	2	3	4
5	6	7	8	9	10	11
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19	20	21	22	23	24	25
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February

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March

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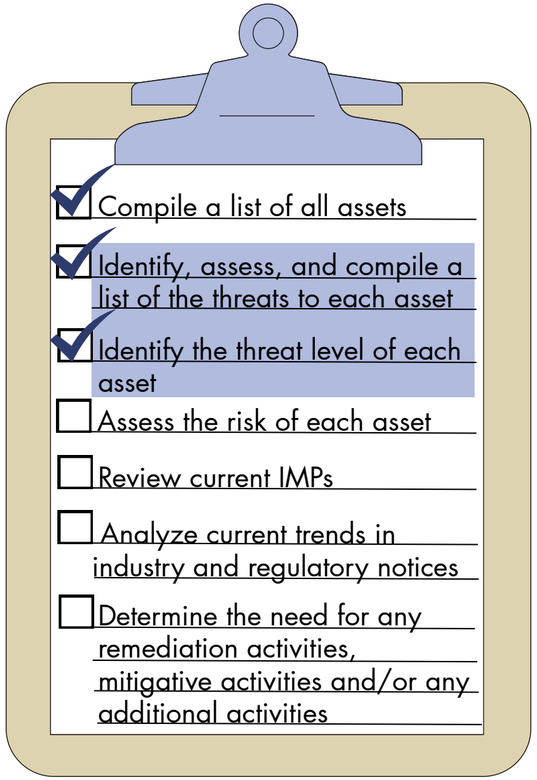
23	24	25	26	27	28	29
30	31					

PHMSA Annual Report Deadline

Threats

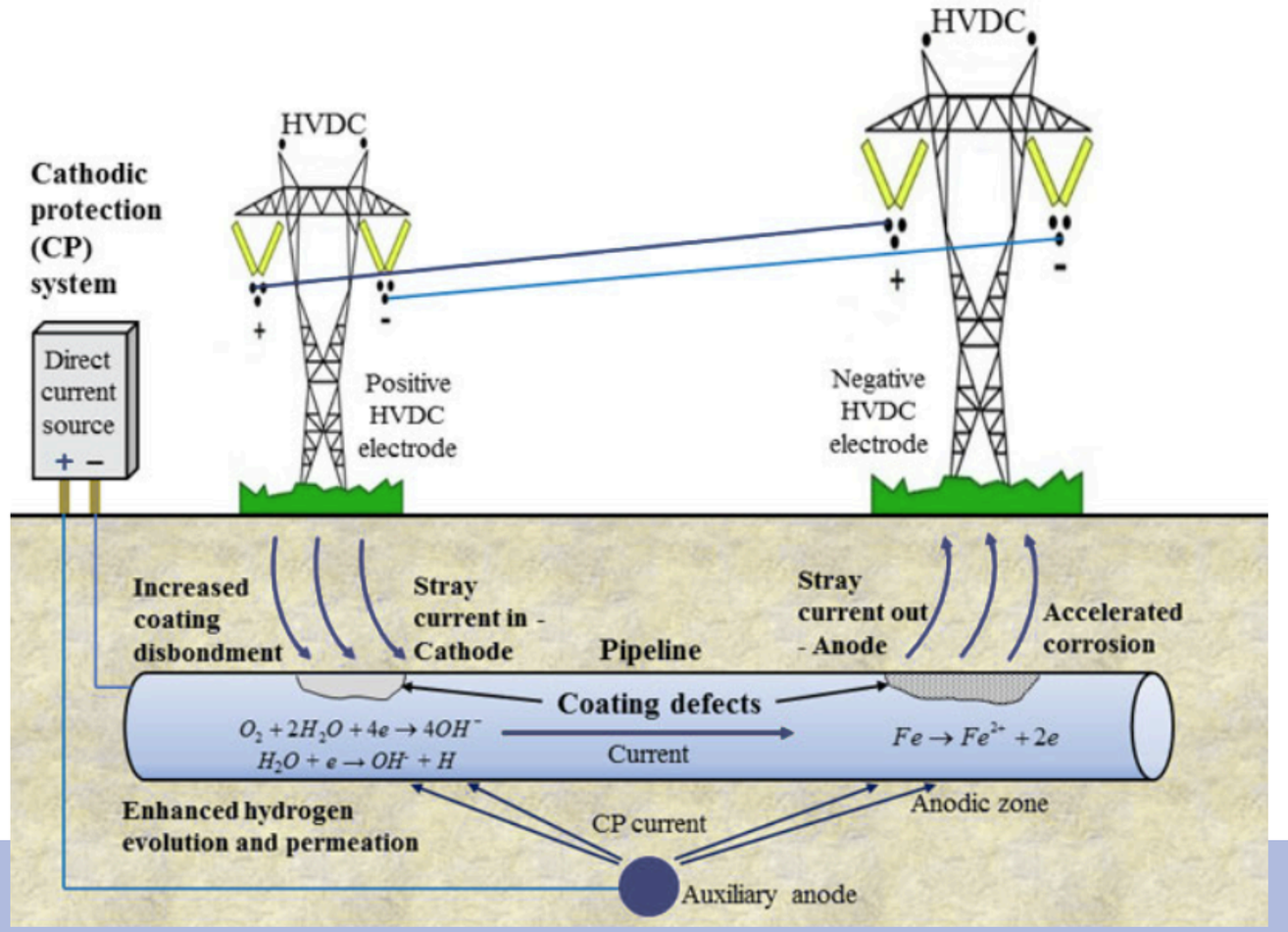


- Corrosion
- Natural forces
- Excavation damage
- Other outside force damage
- Material
- Welds
- Equipment failure
- Incorrect operations
- Any additional issues

Example Threat: EC

Interference currents

- Check for unusual pipe to soil ("p/s") potential
  - Sources: other pipelines, DC rail or mining operations, or CP systems
  - High voltage electrical power distribution systems
- Surveys
  - CIS
  - Data loggers



https://advanceseng.com/accelerated-corrosion-pipeline-steel-reduced-cathodic-protection-effectiveness/

Federal regulations regarding interference currents:

- 49 CFR 192.473 External corrosion control: Interference currents
- 49 CFR 193.2633 Interference currents.
- 49 CFR 195.577 What must I do to alleviate interference currents?

Example Threat: EC

Rapid corrosion possible from interreference currents

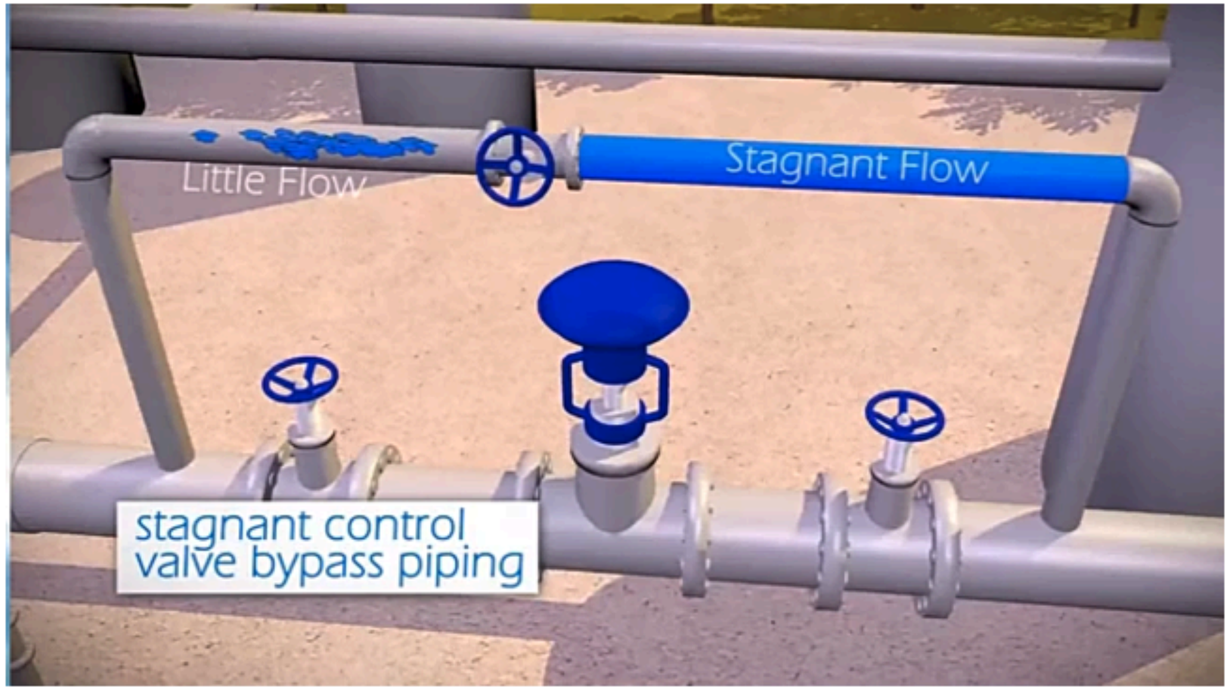
<u>Federal regulations regarding interference currents:</u>

- 49 CFR 192.473 External corrosion control: Interference currents
- 49 CFR 193.2633 Interference currents.
- 49 CFR 195.577 What must I do to alleviate interference currents?

Example Threat - Dead legs[0]

*"**Dead legs** can be very alive..."*

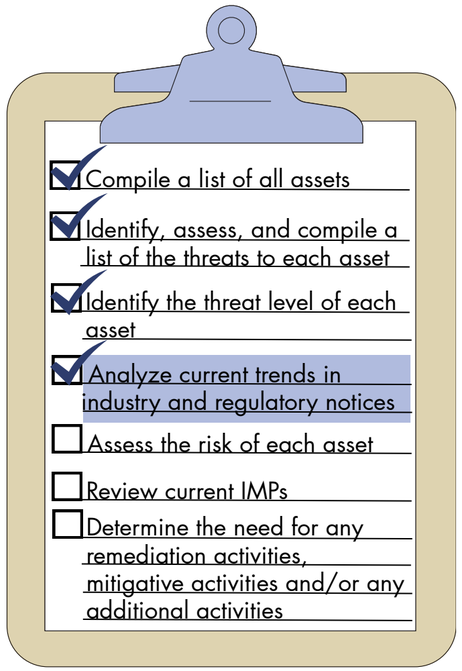
- Identify and review all dead legs regularly
- Establish a management plan that includes:
  - Periodic flushing
  - Inspection plans

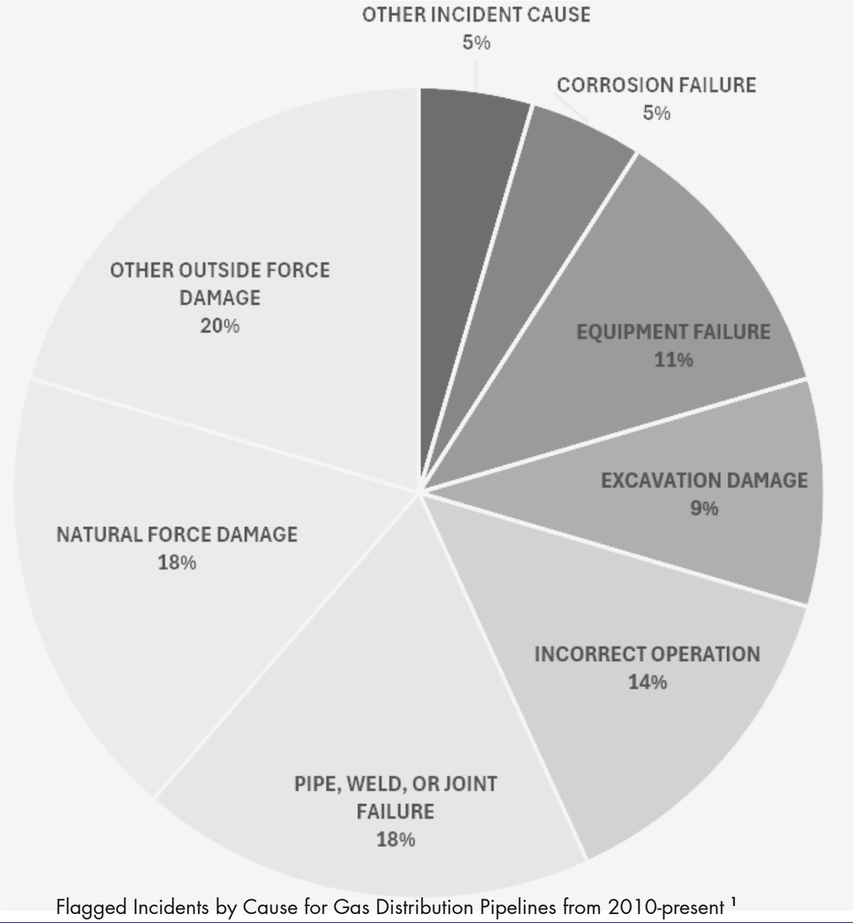


https://inspectioneering.com/journal/2021-12-29/9952/management-and-identification-of-dead-legs

[0] https://www.aiche.org/resources/publications/cep/2022/february/process-safety-beacon-piping-dead-legs-another-hazard-plain-sight

Trends





Flagged Incidents by Cause for Gas Distribution Pipelines from 2010-present [1]

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

1200 New Jersey Avenue, SE
Washington, D.C. 20590

July 17, 2025

From: Linda Daugherty, Acting Associate Administrator for Pipeline Safety, PHMSA

To: Office of Pipeline Safety Staff, PHMSA

Subject: Inspection and Enforcement Priorities[1]

LINDA GAIL DAUGHERTY
Digitally signed by LINDA GAIL DAUGHERTY
Date: 2025.07.17 17:04:56 -04'00'

SUMMARY

This memorandum establishes the inspection and enforcement priorities (priorities) of the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS). By focusing OPS's inspection and enforcement priorities on areas that provide the greatest positive impact to pipeline safety, OPS will be better positioned to fulfill its statutory mission and avoid wasting valuable resources on efforts that produce minimal benefits or that are based on unduly broad, novel, or strained application of the pipeline safety laws or regulations.

OPS has identified its inspection and enforcement priorities through careful analysis of incident and accident data, inspection and investigation findings, and input from staff and other stakeholders. These priorities reflect the current policies, practices, and procedures of the Department of Transportation (DOT) and will guide OPS's efforts in conducting inspections and investigations and initiating enforcement actions.

State authorities with certifications to regulate the safety of intrastate pipeline facilities are encouraged to follow these inspection and enforcement priorities in implementing their pipeline safety programs. State authorities with agreements to perform inspections and investigations on behalf of PHMSA should follow these priorities to the same extent as OPS staff.

BACKGROUND

The Pipeline Safety Act (PSA) authorizes PHMSA to promulgate "minimum safety standards for pipeline transportation and for pipeline facilities" in order "to provide adequate protection against

[1] This memorandum is not intended to, does not, and may not be relied upon to create any right or benefit, substantive or procedural, enforceable at law or equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

PHMSA's Enforcement Priorities Announcement [2]

[1] https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/data_statistics/pipeline/PHMSA_Pipeline_Safety_Flagged_Incidents.zip [2] https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2025-07/PHMSA%20OPS%20Inspection%20and%20Enforcement%20Priorities%20Memo.pdf

Risk

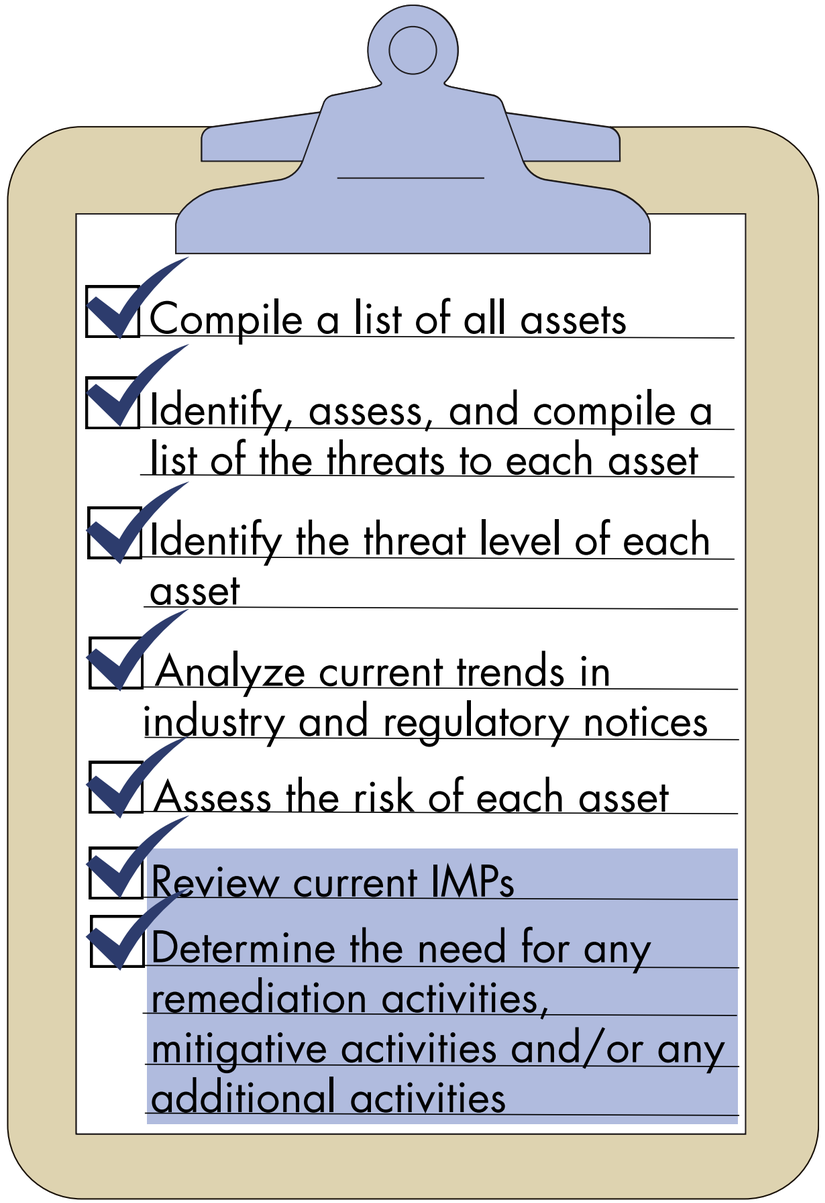
- [x] Compile a list of all assets
- [x] Identify, assess, and compile a list of the threats to each asset
- [x] Identify the threat level of each asset
- [x] Analyze current trends in industry and regulatory notices
- [x] Assess the risk of each asset
- [ ] Review current IMPs
- [ ] Determine the need for any remediation activities, mitigative activities and/or any additional activities

Risk = Likelihood x Consequence

Review

Review Current IMPs

Determine any gaps to be addressed

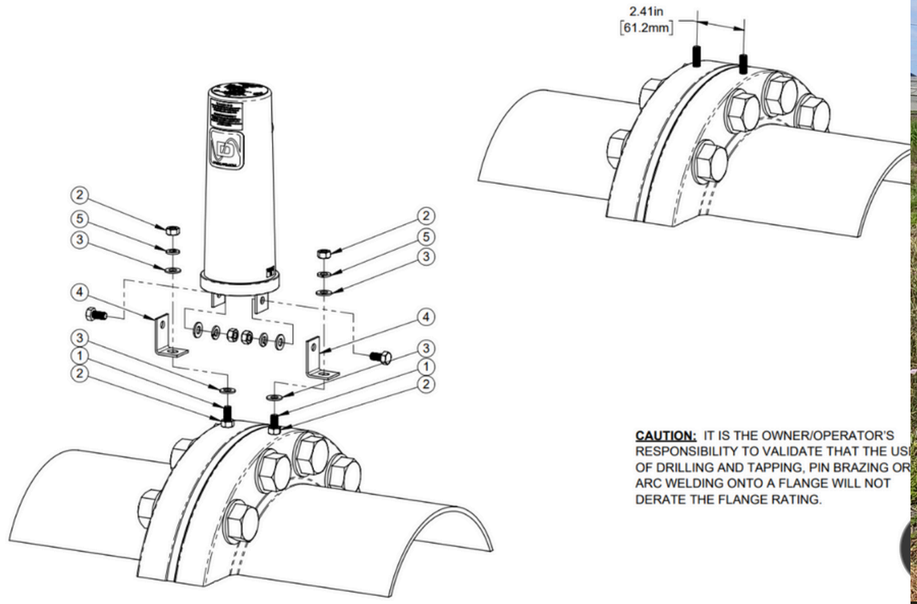


EC P&MM: Interference

BILL-OF-MATERIAL KIT #:2590, DOCUMENT NAME: MTT-M8

Y.	LINE NO.	DOCUMENT NUMBER	DESCRIPTION	QTY.
	1	2517	STUD FULLY THREADED M8-1.25X35MM	2
	2	1200	NUT HEX M8-1.25	4
	3	1194	WASHER FLAT 5/16"	4
	4	2513	BRACKET 1 FLANGE MOUNT DECOUPLER PLATED	2
	5	1195	WASHER SPLIT LOCK 5/16"	2
	6	3041	TEF-GEL	1

Decouplers, monitoring, and isolation



CAUTION: IT IS THE OWNER/OPERATOR'S RESPONSIBILITY TO VALIDATE THAT THE US OF DRILLING AND TAPPING, PIN BRAZING OR ARC WELDING ONTO A FLANGE WILL NOT DERATE THE FLANGE RATING.

ASME Y14.5M 2018 APPLIES	MATERIAL: NA	DRAWN: JPW	DATE DRAWN: 2014-01-21	DAIRYLAND EL INDUSTRIES, I P.O. BOX 187 STOUGHTON, WI 53589 608-877-9900
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. COMPUTER-GENERATED DRAWING. DO NOT EDIT MANUALLY.	FINISH: NA	DWG APPROVAL: JSJ	DATE APPROVAL: 06/28/2023	
.XXX = ±.005" .XX = ±.01" .X = ±.03" ANGLES = ±1° 63		TITLE: MTT/MTS KIT INSTALLATION		
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF DAIRYLAND ELECTRICAL INDUSTRIES, INC. ANY REPRODUCTION IN PART OR WHOLE, WITHOUT THE WRITTEN PERMISSION OF DAIRYLAND ELECTRICAL INDUSTRIES, INC. IS PROHIBITED.		SHEET: 1 OF 4	DWG SIZE: B	SCALE: 1:4 REV: D PART #: 1(

Federal regulations regarding interference currents:

- 49 CFR 192.473 External corrosion control: Interference currents
- 49 CFR 193.2633 Interference currents.
- 49 CFR 195.577 What must I do to alleviate interference currents?

https://www.dairyland.com/applications/ac-voltage-mitigation/


Design
Assess
Design
Do
Improve written integrity programs/procedures
Conduct inspections and testing on assets by risk priority
Schedule the activities in the prioritized list established during the “assess” phase
Plan any inspections/ reporting that are necessary for the year

Example Timeline of Design Phase

DESIGN

Conduct inspections & testing

Schedule future activities, such as repairs

Improve current IM Program/Plans

April

M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

May

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June

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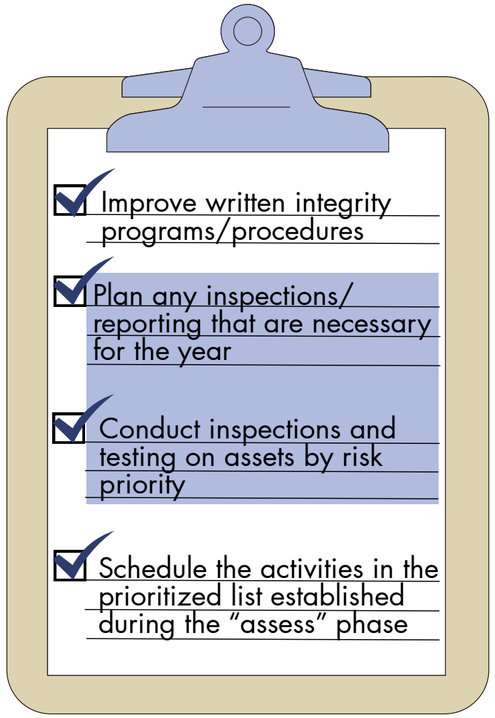
29	30					

Inspections



When planning inspections, consider the benefits of planning inspections in succession of one another.

Common Problems in Corrosion Inspections

Quality of records

Quality of field reports makes it difficult to demonstrate compliance with enhanced remediation requirements for transmission pipelines

Struggle to account for IR drops on galvanic systems

- *Inability to interrupt*
- *Disconnecting anodes*
- *Further corrosion surveys may be necessary*

Common Problem in Corrosion Inspections

Spacing between CP tests points is too large to determine the "adequacy" of cathodic protection

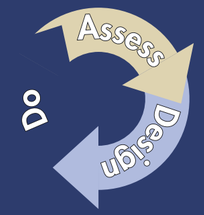
- *CIS Surveys*
- *Readings*
- *Leak History*

Scheduling

- [x] Improve written integrity programs/procedures
- [x] Plan any inspections/ reporting that are necessary for the year
- [x] Conduct inspections and testing on assets by risk priority
- [x] Schedule the activities in the prioritized list established during the “assess” phase

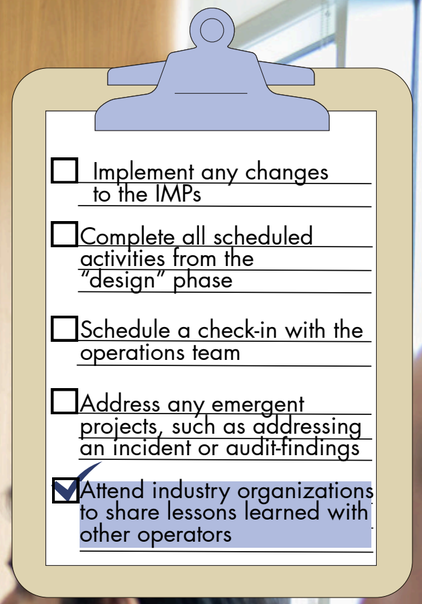
Using the results of the inspections, schedule any future activities, such as repairs.

Do



- [ ] Implement any changes to the IMPs
- [ ] Complete all scheduled activities from the "design" phase
- [ ] Schedule a check-in with the operations team
- [ ] Address any emergent projects, such as addressing an incident or audit-findings
- [x] Attend industry organizations to share lessons learned with other operators

Group Discussion



Take 10 minutes to discuss with your fellow attendees about corrosion problems your company is facing.

Example Timeline of Do Phase

DO

Implement changes to your IMP	Audit your facilities	Develop audit reports

July

M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

August

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31						

September

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14	15	16	17	18	19	20
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DO

Review audit reports	Budget review/planning for next year	Check-in with operations teams

October

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			1	2	3	4
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November

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December

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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Implementation

- [x] Implement any changes to the IMPs
- [ ] Complete all scheduled activities from the "design" phase
- [ ] Schedule a check-in with the operations team
- [ ] Address any emergent projects, such as addressing an incident or audit-findings
- [x] Attend industry organizations to share lessons learned with other operators

Complete all scheduled activities

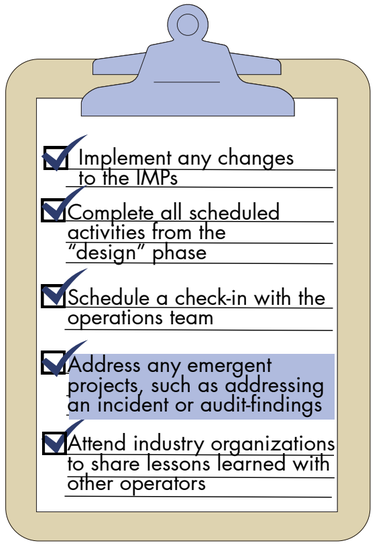
- [x] Implement any changes to the IMPs
- [x] Complete all scheduled activities from the "design" phase
- [ ] Schedule a check-in with the operations team
- [ ] Address any emergent projects, such as addressing an incident or audit-findings
- [x] Attend industry organizations to share lessons learned with other operators

Schedule check-in

Schedule a check-in with your operations teams to discuss the progress of the implementation of the changes to the plans/procedures

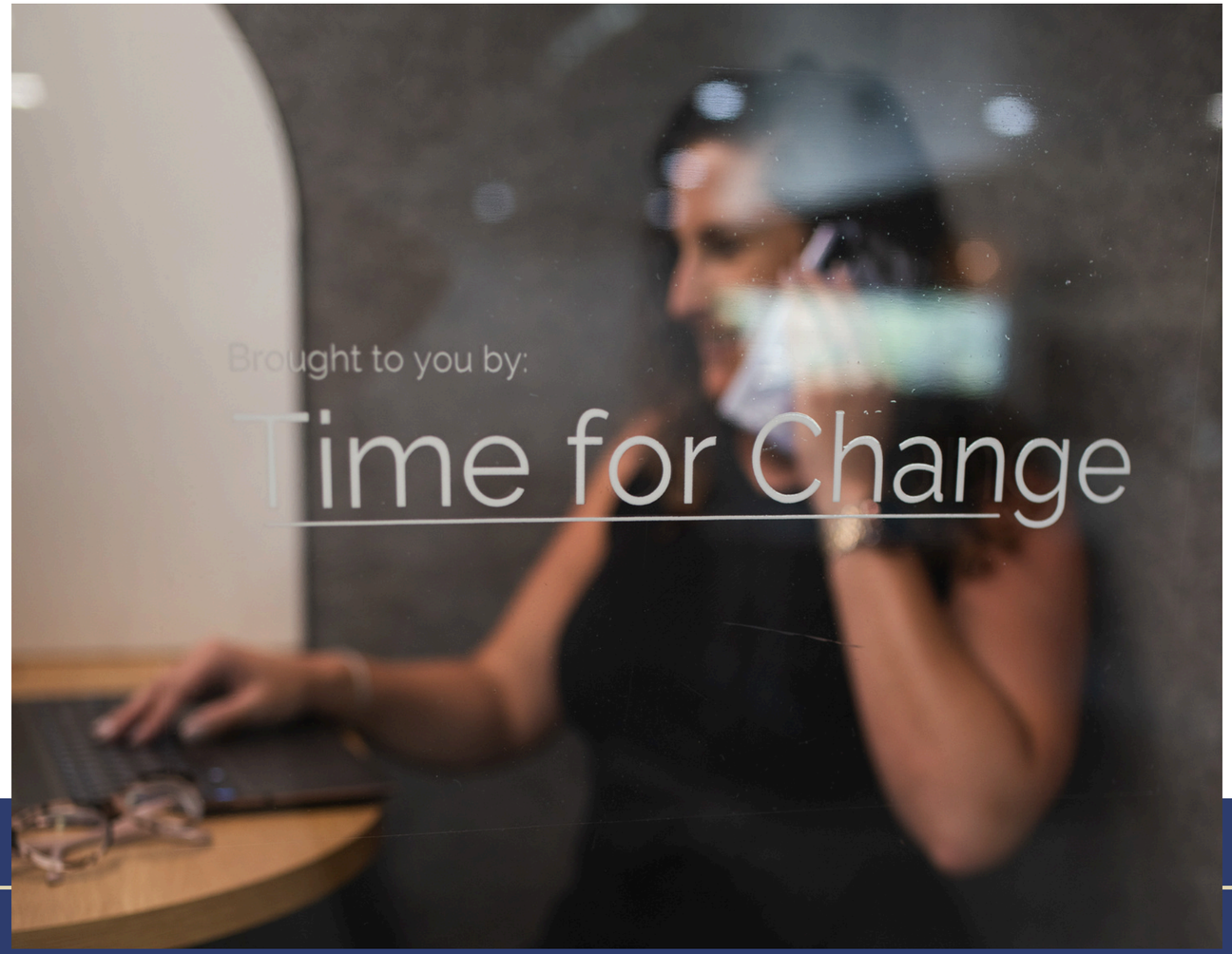
- [x] Implement any changes to the IMPs
- [x] Complete all scheduled activities from the "design" phase
- [x] Schedule a check-in with the operations team
- [ ] Address any emergent projects, such as addressing an incident or audit-findings
- [x] Attend industry organizations to share lessons learned with other operators

Address Emergent Issues



Addressing emergent issues should be treated as the priority throughout the year

Action Item Identification



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832-850-4104

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QUICK REMINDER

Share Your Feedback While It's Fresh!

ROI: Return on INTEGRITY— Maximizing Value Through Proactive Corrosion Control

Wednesday | October 29, 2025

3:00 PM – 4:30 PM | Peacock Salon C

- **Take a minute to complete surveys after session completion.**
- **Your thoughts help us improve future sessions.**
- **Filling it out right after the session means you don't have to worry about it later!**

SCAN FOR SURVEY

Your feedback matters — help us improve.

VUSC
VIRGINIA UTILITY SAFETY CONFERENCE