
PROGRAM REVIEW

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Public Service Commission
Of West Virginia**

ADB – 2014 - 05

- ✘ *Guidance for Strengthening Pipeline Safety Through Rigorous Program Evaluation and Meaningful Metrics*
- ✘ Issued October 15, 2014

ADB-2014-05

- ✘ Follow-up to ADB-2012-10 *Using Meaningful Metrics in Conducting Integrity Management Program Evaluations*
- ✘ Response to NTSB recommendations for integrity management programs

ADB – 2014-05

- ✘ Written for integrity management evaluation, but processes useful for other program evaluations
- ✘ Describes process for any program evaluation for continuous improvement
- ✘ Precursor to API RP 1173 – Pipeline Safety Management Systems (PSMS)

API RP 1173 – PIPELINE SAFETY MANAGEMENT SYSTEMS

- ✘ Published in 2015
 - + Errata 1 published April 2025
- ✘ PHMSA ADB 2025-01
 - + March 25, 2025
 - + Promoting implementation of pipeline safety management systems
 - + Addresses NTSB recommendation P-24-002

CODE REQUIREMENTS FOR REVIEW

- × §§192.605(a) or 195.402(a) General
 - + Each operator shall prepare and follow..., a manual of written procedures for conducting operations and maintenance activities and for emergency response. ...
 - + This manual must be reviewed and updated but the operator at intervals not exceeding 15 months, but at least once per calendar year.

CODE REQUIREMENTS FOR REVIEW

§§ 192.605(b)(8) 195.402(c)(13)– O&M Manual

- + periodically reviewing work done by personnel to determine effectiveness and adequacy of procedures and modifying procedures when deficiencies are found

§§ 192.605(c)(4) 195.402(d) – Abnormal operations

- + Periodically reviewing the response to determine effectiveness of procedures, and taking corrective actions when found

CODE REQUIREMENTS FOR REVIEW

§§ 192.615(b)(3) 195.402(e)(9)– Emergency Plans

- + Review employee activities to determine if procedures were effectively followed

§§ 192.616(c) 195.440– Public Awareness

- + Must follow the general recommendations of API RP 1162, including Section 8 – Program Evaluations
- + Program should include measures, means and frequency for tracking performance and addressing changes

CODE REQUIREMENTS FOR REVIEW

§§ 192.617 195.402(c)(5)– Failure Investigations

- + Procedures for analyzing accidents and failures to determine causes, provide lessons learned and minimize the possibility of recurrence
- + Transmission additional requirements

§§ 192.631 195.446 - CRM

- + Procedures for controller responsibilities, alarm management plan and training plan reviewed for effectiveness at least once each calendar year, but at intervals not exceeding 15 months

CODE REQUIREMENTS FOR EFFECTIVENESS EVALUATIONS

- × §192.945 – Gas Transmission IM
 - + Methods to measure whether the program is effective
- × §192.1007(e)(f) – Distribution IM
 - + Measure performance, monitor results, and evaluate effectiveness
- × §195.452(k) IM
 - + What methods to measure program effectiveness must be used?

PROGRAM EVALUATION

- ✘ Ongoing process to measure, assess and evaluate program performance and effectiveness using key performance indicators (KPIs)
 - + measure the accomplishment and effectiveness of programs and associated activities
 - + measure outcomes of the programs and activities, provide documented success or failure of activities.

PROGRAM EVALUATION

- ✘ Key performance indicators (KPIs) should be applied:
 - + System wide
 - + Uniform, consistent way, and
 - + Draw on experiences and data across the system

PROGRAM EVALUATION

- × Leading indicators
 - + How well program is being implemented
 - + Are we doing what we said we would do?
- × Examples include:
 - + Use of P&M or accelerated action activities
 - + Communication activities for IM or PA
 - + Collection of missing or unknown data

PROGRAM EVALUATION

- × Lagging indicators
 - + May be considered results
 - + How well did we do it
- × Examples include:
 - + Leaks by cause
 - + Third party damage
 - + Repaired leaks, defects or pipe replacements
 - + Miles of pipeline assessed

PROGRAM EVALUATION

- ✘ Formal controlled process for continual improvement of programs
- ✘ Series of systematic steps for learning, analysis and knowledge of process
- ✘ Integral part of the quality control/quality assurance process

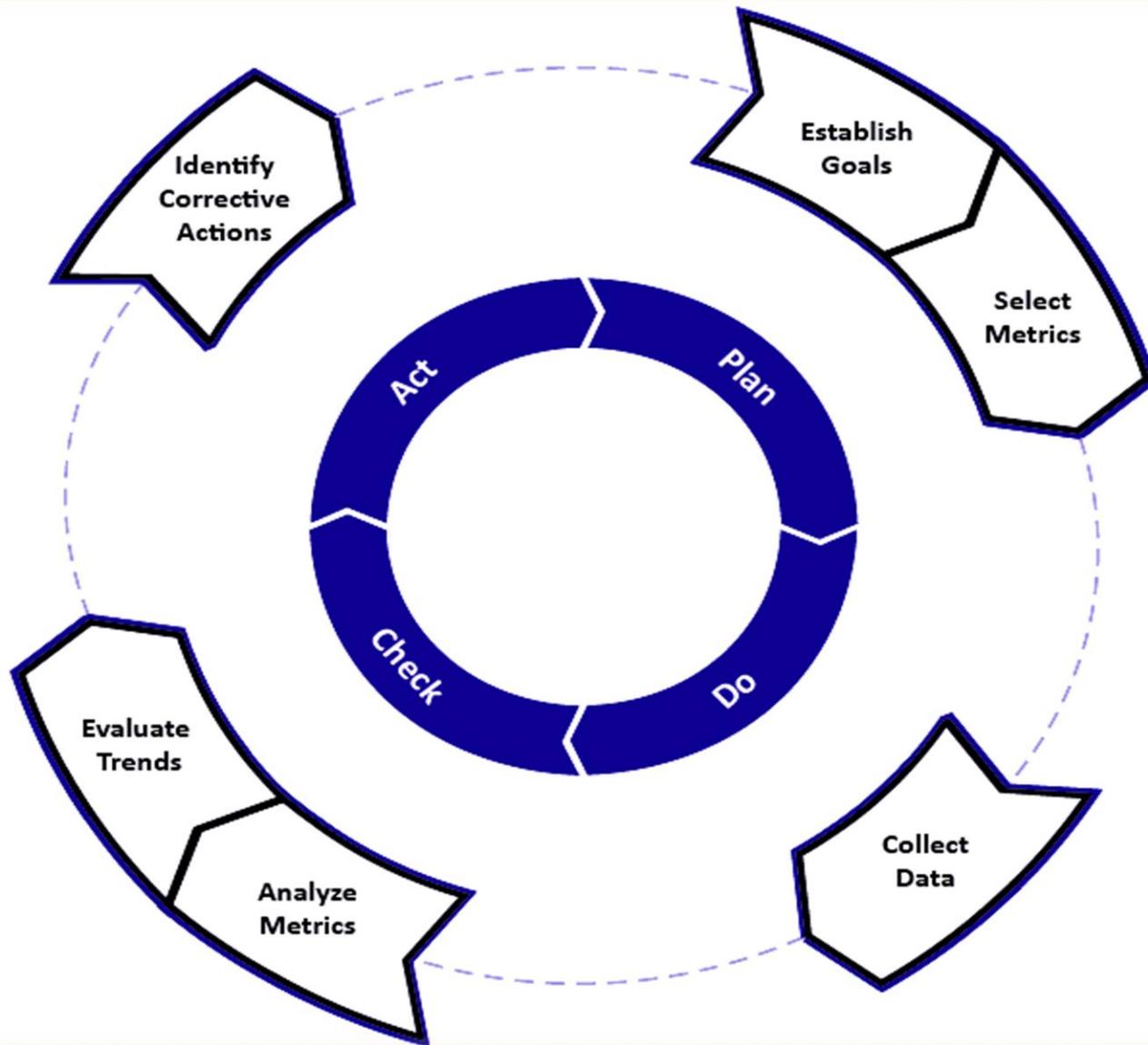
PROGRAM EVALUATION

- ✘ Written detailed procedures describing process
- ✘ Should include sufficient detail about processes/procedures for an outside observer, or a new employee becoming involved to understand how an activity is performed and provide consistent, reproducible results. (TIMP FAQ -238)

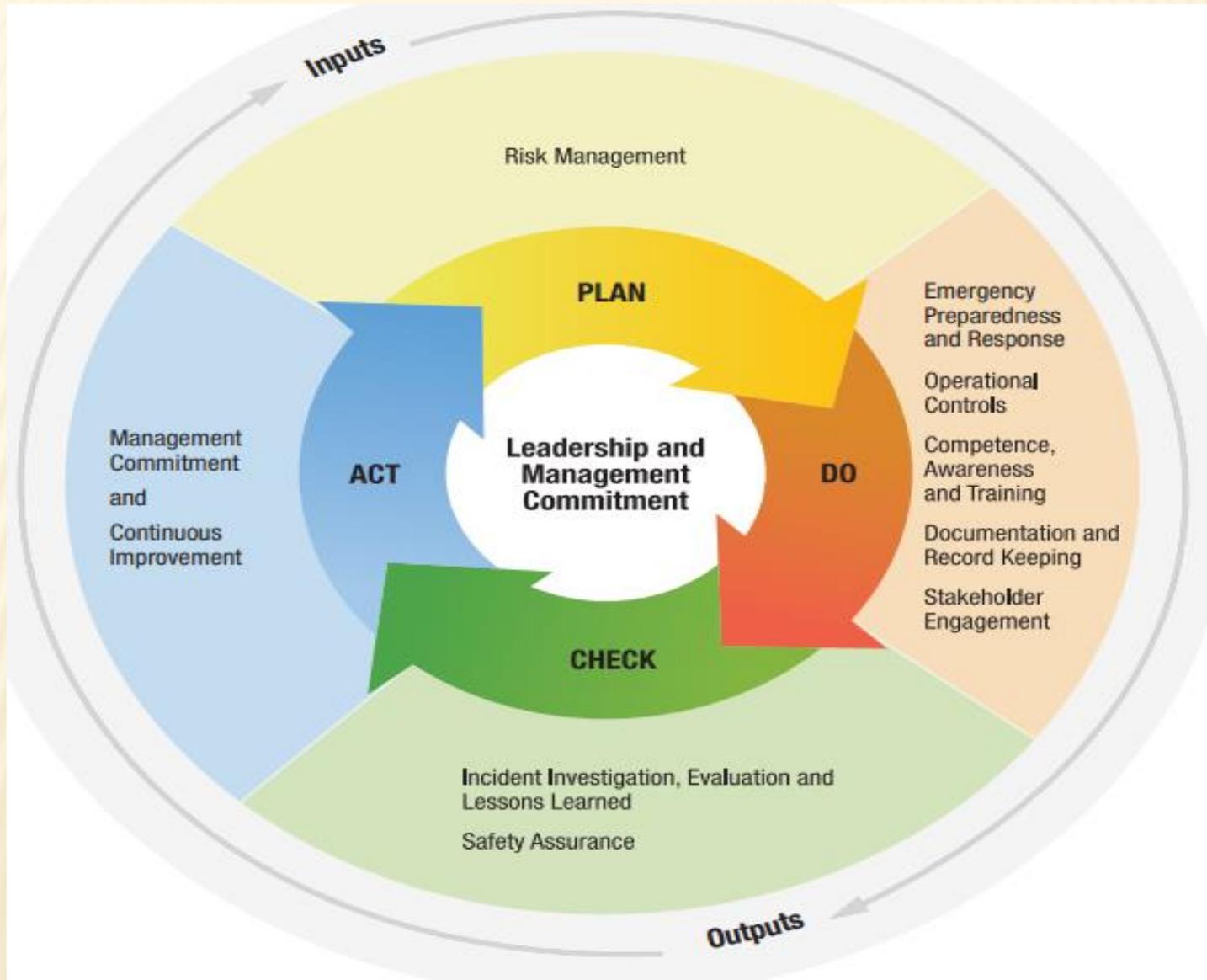
PROGRAM EVALUATION

- ✘ Most effective using 4-step management method for control and continuous improvement of processes
 - + PDCA (Plan-do-check-act)
 - + PDSA (plan-do-study-act)
 - + Deming cycle
- ✘ API RP 1173, Safety Management Systems

PROGRAM EVALUATION



PCDA CYCLE (API RP 1173)



PROGRAM EVALUATION - PLAN

- ✘ Establish processes, objectives and goals
- ✘ Select metrics
 - + What will be measured
 - + How it is measured
 - + Who will provide data
 - + When will data be collected
 - + Why the metric was chosen
- ✘ Implementation metrics – planned activities such as ILI runs, pipeline replacement, or stakeholder communications

PROGRAM EVALUATION - PLAN

- × Metrics can be chosen
 - + Company wide
 - × Third party damage
 - + System specific
 - × Reduce leaks on Type R gathering lines
 - + Process specific
 - × Reduce low corrosion reads
 - + Product specific
 - × Replace type of regulator

PROGRAM EVALUATION - PLAN

- ✘ Some metrics specified in code
 - + Integrity management (annual reports)
- ✘ Some are specified in incorporated by reference documents
 - ✘ Public Awareness – API RP 1162
- ✘ Other metrics chosen by operator to best represent their system
 - ✘ Cast iron or legacy pipe replacement

PROGRAM EVALUATION - METRICS

- × Characteristics of effective metrics
 - + Reliable – unbiased, specific and discrete
 - + Repeatable – similar data and results
 - + Relevant – meaningful to system
 - + Meaningful – sufficient data to measure +/- change
 - × Zero year after year not a useful metric
 - + Easy to use and compare – across industry or company

PROGRAM EVALUATION - PLAN

- ✘ Goals or metrics periodically reaffirmed
 - + Can change over time
 - + 5 year pipe replacement program – goes away after completed
 - + Can be normalized over time, mileage, pipe material or throughput to reduce data spikes
 - ✘ 5 year rolling average
 - ✘ Per 100, or 1000 miles
 - ✘ Per number of readings

**Metrics do not have to be
unique – can be shared
among evaluation processes**

Example - Third party line hits

- + used for damage prevention, public awareness, and integrity management

PROGRAM EVALUATION - PLAN

- × Goals or metrics communicated with organization
 - + E-mails, staff or safety meetings, posters
 - + Shared with contractors
 - + Outline expectations

PROGRAM EVALUATION - DO

- × Implement and execute the processes
 - + P&M measures or additional actions
 - + Perform required elements
 - × Assessments for IM
 - × Stakeholder communication
 - × Regulatory required tests and inspections
- × Collect data or information
 - + How often is data collected
 - × Annually, once a quarter
 - × Depend on data and amount of data

PROGRAM EVALUATION - CHECK

- ✘ Outcomes monitored to test validity for success, problems or improvement
- ✘ Analyze the data against requirements and expectations
 - + May not know at beginning what data will show
 - + Reach expected goals or performance levels
 - + Perform all the implementation
 - + Number of additional activities

PROGRAM EVALUATION - CHECK

- ✘ Report results to determine if objectives and results being achieved
- ✘ Look for trends or deviations from expectations
- ✘ Analyze differences to determine causes and corrective actions
- ✘ Determine if using proper metrics
 - + Zero year after year valid?
 - + Intervals of metrics correct?

PROGRAM EVALUATION – ACT

- ✘ Integrate the learning generated by the process
- ✘ Identify corrective actions where actual results differ significantly from expected results
 - + Accuracy of data or identified metric
 - + Procedures inadequate or inaccurate
 - + Changes to metrics - adding new or deleting old or out of date

PROGRAM EVALUATION – ACT

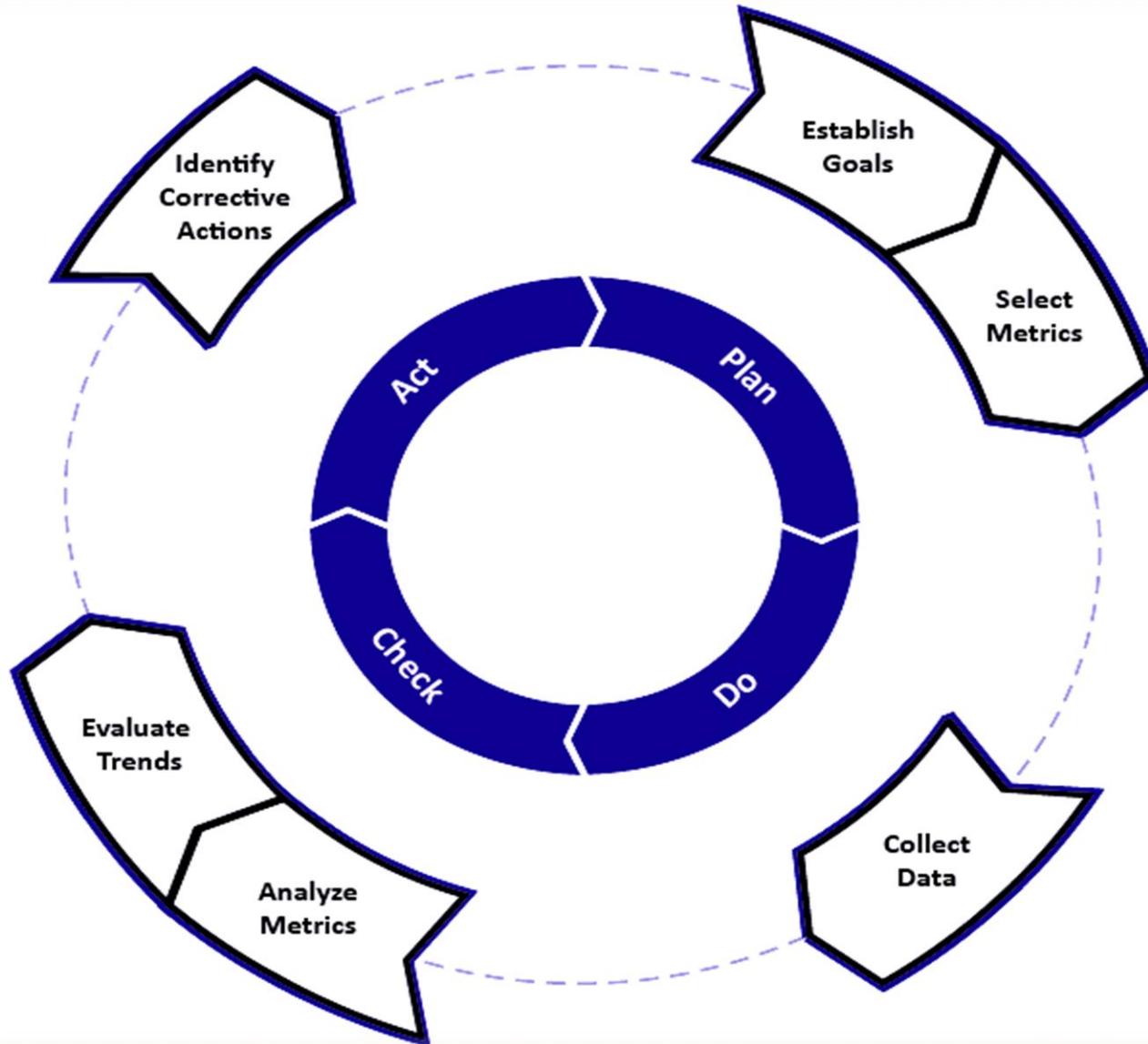
- × Implement the necessary changes
 - + Changes identified, but never implemented
 - + Person responsible for implementation
 - + Documentation of implementation

PROGRAM EVALUATION – ACT

- ✘ Management of change process
 - + §192.13(d) – Onshore Transmission pipelines
 - ✘ February 26, 2024
 - ✘ Steps outlines in ASME B31.8S and §192.13(d)
 - + Also required for CRM and gas transmission IM
 - + Single plan to cover all requirements

MOC is good practice for all pipelines

PROGRAM EVALUATION



PROGRAM EVALUATION

- ✘ Periodic self assessments
 - + Internal/external
 - + Management review
 - + Other evaluations (including regulatory)
- ✘ Review will validate conclusions
- ✘ Reviews provide performance feedback and improvements to process

WRITTEN PROCEDURES

- × What is the evaluation process?
 - + Scope and objectives of review
 - + Frequency of review - regulatory, operator specified, event driven
 - + Steps and documentation
 - × Data collection
 - × Performance goals
 - + Who is responsible or participates in review
 - × Personnel outside of process
 - + How deviations are addressed

WRITTEN PROCEDURES

- × What is the evaluation process?
 - + Corrective actions or changes
 - + Responsibility for implementation of changes
 - + Documentation requirements
 - + Define significant changes
 - × Example – OQ, O&M Manual
 - + Communication of changes
 - + Record keeping requirements

EFFECTIVENESS EVALUATIONS

- × Effectiveness measured through analysis and understanding of data and performance measures
 - + Integrity Management
 - × P&M measures or additional actions improve integrity
 - × Assessments as required
 - + Public Awareness
 - × Mailings or contacts with stakeholder audiences
 - × Message being heard and understood

EFFECTIVENESS EVALUATIONS

- ✘ Is the program doing what is desired and expected
- ✘ Deviations from expectations
 - + Right metrics
 - + Documentation of deviations
- ✘ Just having data is not an evaluation
- ✘ Need to understand what information and data means

EVALUATION REVIEW TEAMS

- × Cross functional review teams
 - + Sole ownership of process
 - + Too familiar with process can often put on “blindness”
 - + Personnel outside of process can provide valuable feedback outside of process
 - × IM program may affect O&M processes
 - × Failure investigations may affect IM, O&M

CASE STUDY – PROGRAM REVIEWS

- Gas distribution system on New Jersey shore
 - Both barrier islands and mainland
- Superstorm Sandy
 - Landfall on 10/29/2012
 - Storm surge ≥ 13.3 feet
 - System pressurized during storm



CASE STUDY

- After storm hit
 - Curtailed service to 31,000 customers
 - Repressurized or replaced 270 miles of main in less than 6 weeks
 - Installed one mile of new 12" steel main in three weeks





12" 60lb main

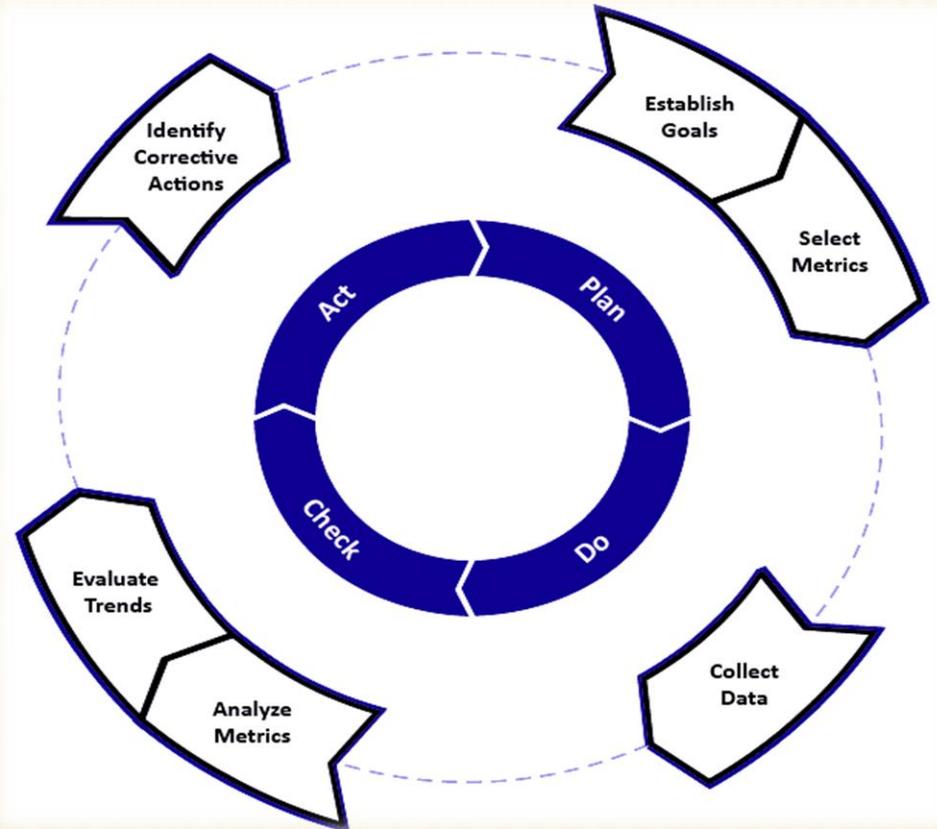
CASE STUDY

- Roads and bridges washed away
- Sand drifts 7 feet tall
- Debris and flooding
- Leaks
- Valves and other equipment buried



PROGRAM EVALUATION

How did event affect various programs?



PROGRAM REVIEWS

- Integrity Management - Threats have changed
- Corrosion threats
 - External
 - Internal



OTHER PROGRAM REVIEWS

- × Emergency plan
 - + Lessons learned from event
 - + Locating equipment and facilities
- × O&M Manual
- × OQ review
 - + Mutual assistance
- × Public awareness program

PROGRAM EVALUATION

- ✘ Process useful for any program review
- ✘ Written procedures for how program evaluations are performed
 - + Goals
 - + Metrics
 - + Review team
 - + Frequency
- ✘ Implementation of changes
- ✘ Documentation

RESOURCES

- ✘ API RP 1173
- ✘ GPTC
 - + GM Appendix G-192-3 – Effectiveness Evaluation of Programs and Procedures
- ✘ ADB 12-10 – Using Meaningful Metrics
- ✘ ADB 14-02 – IM Lessons from Marshall MI
- ✘ ADB 14-05 – Rigorous Program Evaluation and Meaningful Metrics

Questions