Enforcement Update

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Rules to Remember

Data still under development, and has not yet been finalized.

Background

- PHMSA ensures accurate and complete enforcement records using stringent data entry procedures and quality control

- This high degree of data quality facilitates
    - PHMSA's rigorous case management that accurately tracks each enforcement case every step of the way
    - Data-driven analyses

- PHMSA staff reviewed federal enforcement data and documents for the 79 violation items identified as being causal factors or increasing the severity in 40 gas transmission and hazardous liquid incident/accident [1] enforcement cases

- These violation items determined to be the most serious violations of over 2,900 Notices of Probable Violation items and Warning items initiated by PHMSA between 2010-2016 because these violations were found or alleged to have caused, or increased the severity of a pipeline reportable incident

1) Gas Incident criteria per §191.3; Hazardous Liquid Accident criteria per §195.50. For the purpose of this presentation, all reportable Incidents and Accidents will simply be referred to as "Incidents."

Background

- PHMSA's penalty structure is principally risk-based, so that the seriousness of violations can be roughly quantified on a relative basis by their penalty levels

- Analysis uses penalty levels as a measure of the relative seriousness of violations

Background

- This analysis includes PHMSA's federal enforcement cases (hazardous liquid and gas transmission), and does not include state enforcement actions (gas distribution)

- Because of the greater number of incidents as well as environmental damages associated with hazardous liquid systems, PHMSA investigated far more hazardous liquid than gas transmission incidents; therefore, violations causal to incidents and those that increased the severity of incidents are much more weighted in this analysis to hazardous liquid safety regulations

Figure 1: Hazardous Liquid Pipeline and Gas Transmission Accident/Incident Reports for 2010 - 2016

	Other	Significant	Serious
Hazardous Liquid	1722	1059	15
Gas Transmission	278	507	20

■ Other ■ Significant ■ Serious
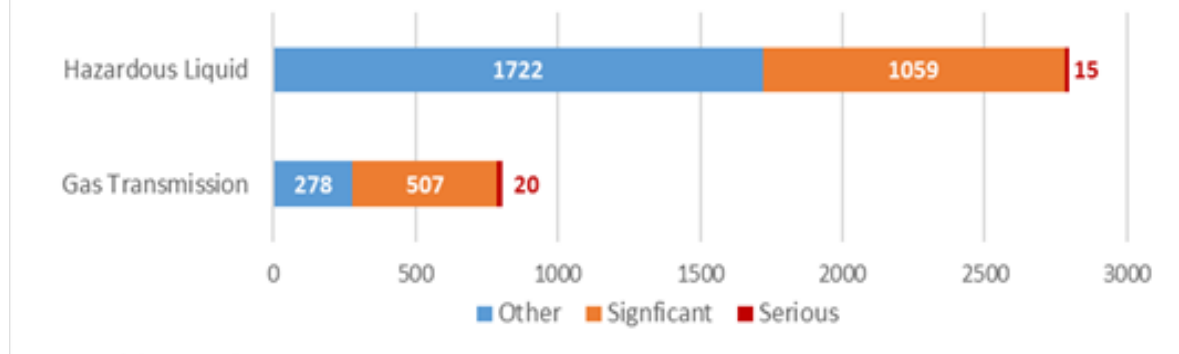
Serious: If there was fatality or injury
Significant: Identify if record meets the significant criteria or not: If there was fatality, injury, fire, explosion, total property damage $50K or more in 1984 dollars, non-HVL loss >= 50bbls, HVL loss >= 5bbls
Other: Incident/Accident record does not meets the significant criteria

Goal

- Goal is to better understand the riskiest violations that may cause, or increase the severity of, incidents so that regulated community and PHMSA can take better preventative actions

- Extra attention may be given to activities and regulations associated with these riskiest violations

Limited Data Set

- Analysis based on a limited data set - 79 violation items identified as causing an incident, or increasing the severity of an incident.

- Therefore, difficult to draw definitive conclusions

Combined Causal and Increased Severity

Most Frequently Cited: Across all violations, Maintenance/Repair violations were the most frequently cited; about 42% (33 violation items), followed by Control Room violations at 24% (19 violation items).
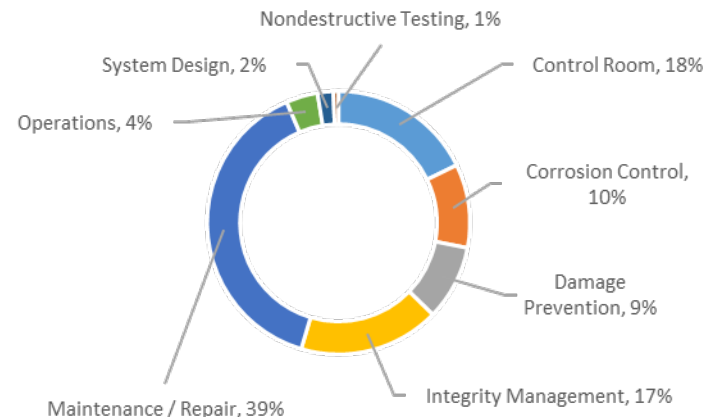
Penalty Amount: Across all violations, Maintenance/Repair violations had the highest total penalty amounts with $5.3M or about 39% of all penalties issued, followed by both Control Room with $2.4M (18%) and Integrity Management with about $2.3M (17%).

Violations related to Integrity Management had the highest penalty per violation item, averaging about $782K.
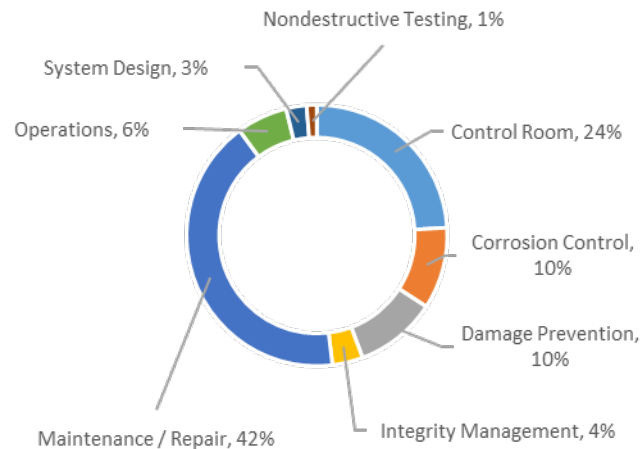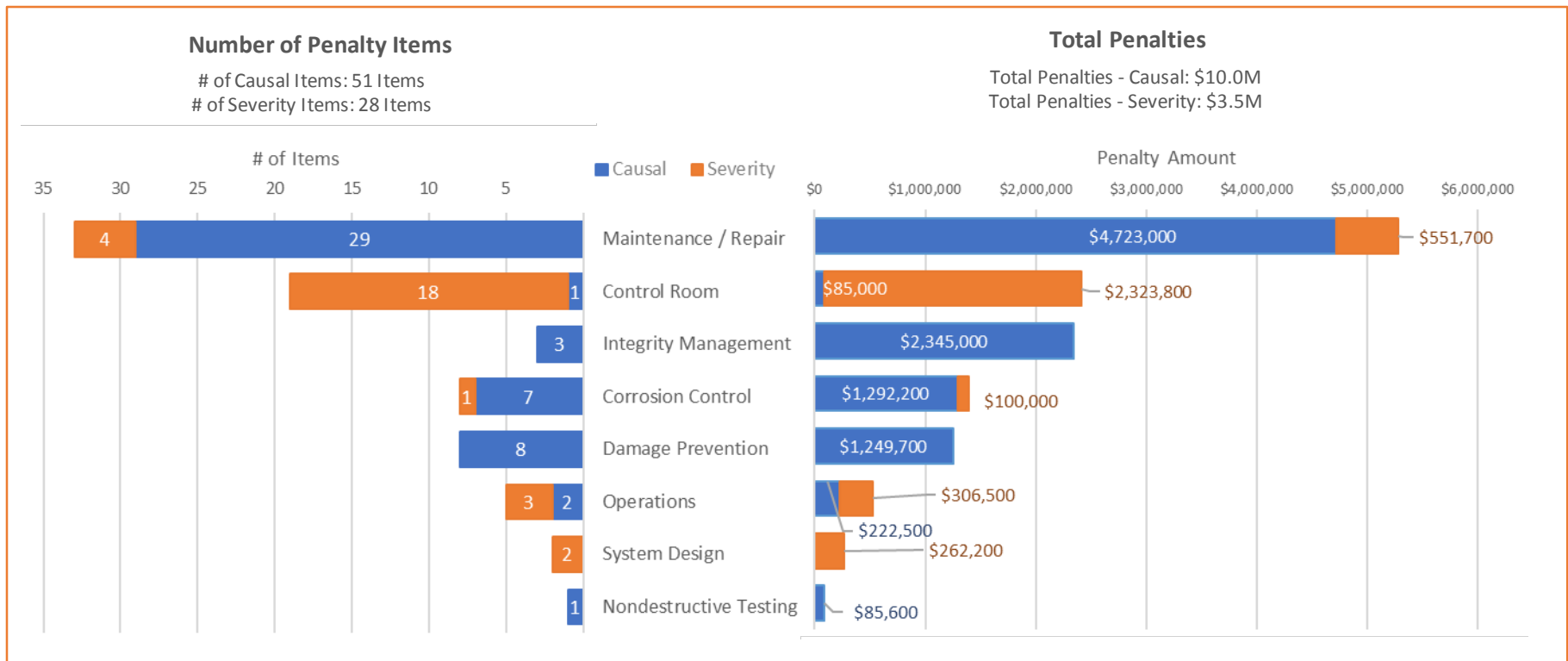
Causal vs. Increased Severity

Causal: Maintenance/Repair regulations were the most commonly cited for causal violations (57%). Maintenance/Repair violations had the highest total penalties amounts ($4.7M). Integrity Management had the highest penalty amount per violation ($782K per violation).

Severity: Violations related to Control Room were the most commonly cited that increased the severity of incident (64%). Control Room violations also had the highest total penalties ($2.3M).

Number of Penalty Items

# of Causal Items: 51 Items
# of Severity Items: 28 Items

Total Penalties

Total Penalties - Causal: $10.0M
Total Penalties - Severity: $3.5M

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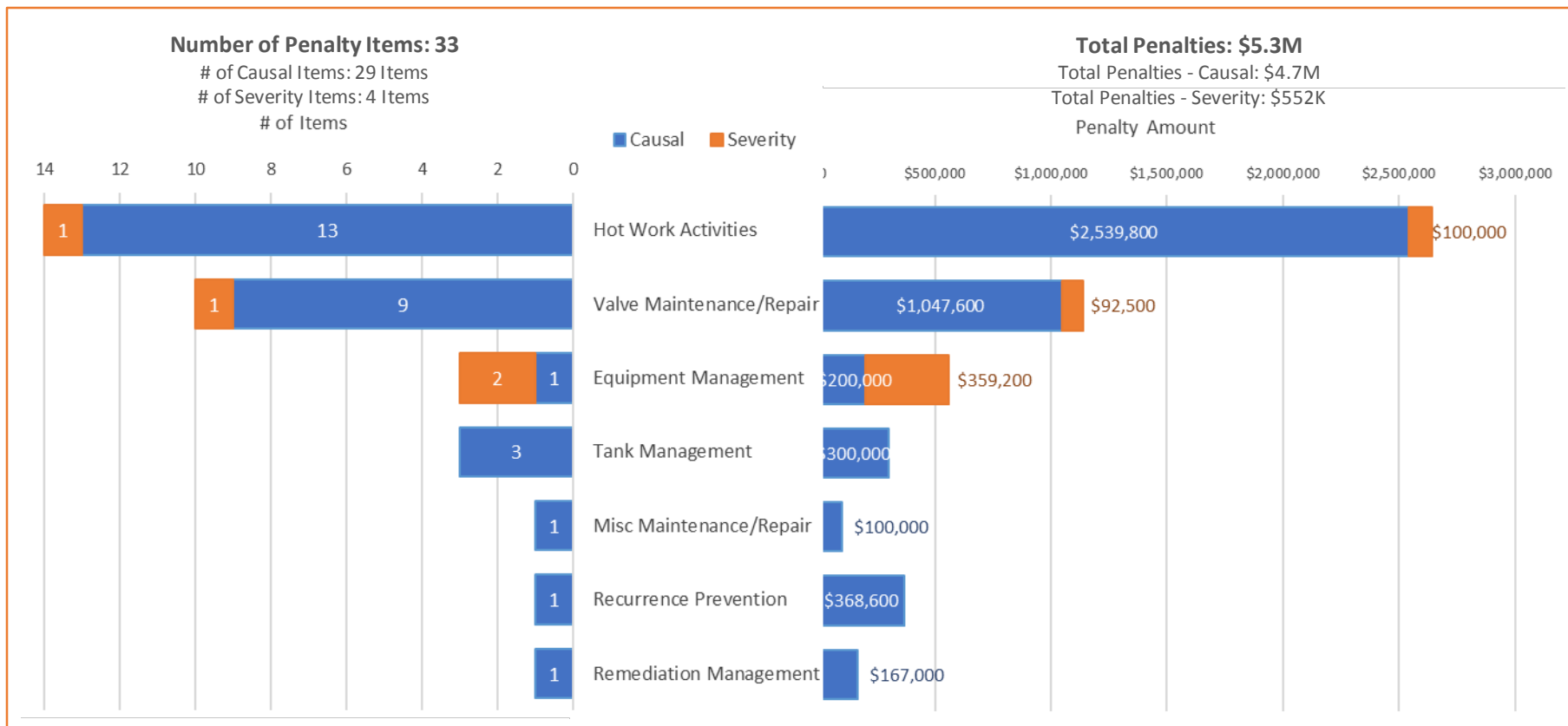Safety Administration

Maintenance / Repair Violations

Maintenance / Repair

PHMSA initiated 33 enforcement penalty items with $5.3M total civil penalties ($4.7M in causal and $0.6M in severity). Drilling down into Maintenance / Repair:

- The most common sub-classification violation categories were related to Hot Work activities (42%) follow by Valve Maintenance/Repair (30%).
- Violations related to Hot Work activities had the highest total penalty amounts ($2.6M).

Number of Penalty Items: 33
# of Causal Items: 29 Items
# of Severity Items: 4 Items
# of Items

Total Penalties: $5.3M
Total Penalties - Causal: $4.7M
Total Penalties - Severity: $552K
Penalty Amount

Category	Causal #	Severity #	Causal $	Severity $
Hot Work Activities	13	1	$2,539,800	$100,000
Valve Maintenance/Repair	9	1	$1,047,600	$92,500
Equipment Management	1	2	$200,000	$359,200
Tank Management	3		$300,000	
Misc Maintenance/Repair	1		$100,000	
Recurrence Prevention	1		$368,600	
Remediation Management	1		$167,000	

Hot Work

Drilling down into Hot Work activities:

- Serious Incidents involved seven fatalities and four injuries

- Five out of fourteen violation items for failure to monitor combustibles during hot work activities

- Thirteen out of fourteen Hot Work related violations involved not following written procedures

Hot Work Activity	# of Total Items	Total Penalty Amount	# of Causal Items	# of Severity Items	Not follow procedure
Failed to monitor combustibles	5	$867,000	5		5
Failed to develop detailed purge plan	1	$400,000	1		1
Failed to train hot work procedures to employee	1	$400,000	1		1
Inadequate safe work condition	2	$200,000	1	1	2
Perform welding on pipe containing combustibles	1	$200,000	1		1
Inadequate equipment installation and operation	1	$200,000	1		
Unsafe welding activity	1	$172,800	1		1
Failed to develop hot work permit	1	$100,000	1		1
Improper tank cleaning/preparation	1	$100,000	1		1
Grand Total	14	$2,639,800	13	1	13

Valve Maintenance / Repair

Drilling down into Valve Maintenance / Repair activities:

- Lockout/Tagout violations accounted for over half of all valve related violations

- Most violations pertained to operators failing to follow their written Lockout/Tagout procedures to ensure the isolation of all energy sources prior to performing maintenance on valves

Valve Maintenance / Repair	# of Total Items	Total Penalty Amount	# of Causal Items	# of Severity Items	Not follow procedure
Failed to complete Lock Out/Tag Out	5	$647,600	5		5
Failed to secure safe work permit	1	$100,000	1		1
Performed valve work on line under pressure	1	$100,000	1		1
Failed to maintain good working condition	1	$100,000	1		
Failed to prepare repair procedure	1	$100,000	1		
Failed to remediate known condition within reasonable time	1	$92,500		1	
Total	10	$1,140,100	9	1	7

Integrity Management Violations

Integrity Management

PHMSA initiated 3 enforcement penalty items as causal factors with total civil penalties of $2.3M. Integrity Management Violations carried the highest Penalty per Violation ($781,667 per violation item). All incidents related to Integrity Management were Major Spills (more than 10,000 gallons)

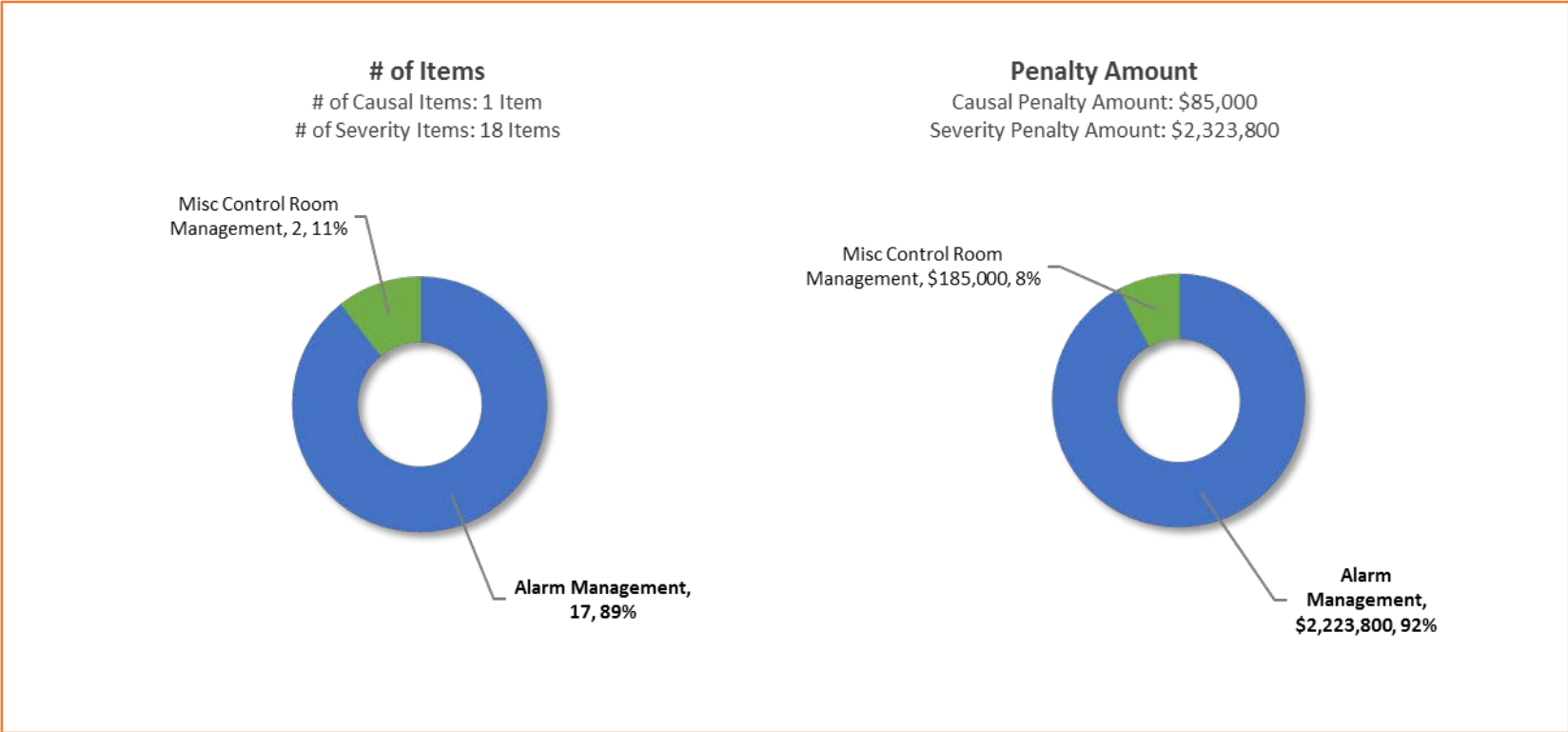| Integrity Management	# of Total Items	Total Penalty Amount	# of Causal Items	# of Severity Items	Not follow procedure
Failed to schedule remediation of corrosion anomalies	1	$1,000,000	1		0
Failed to integrate assessment results into risk ranking	1	$1,000,000	1		0
Failed to perform risk analysis	1	$345,000	1		0
Total	**3**	**$2,345,000**	**3**		**0**

Control Room Violations

Control Room

PHMSA initiated 19 enforcement penalty items with $2.4M overall civil penalties including $2.3M in severity and $85K in causal. Nearly all (17/19) of the violations related to control room increased severity of the incident.

Drilling down into Control Room violations, Alarm Management was most commonly cited (17 of the 19 Control Room violations assessed)
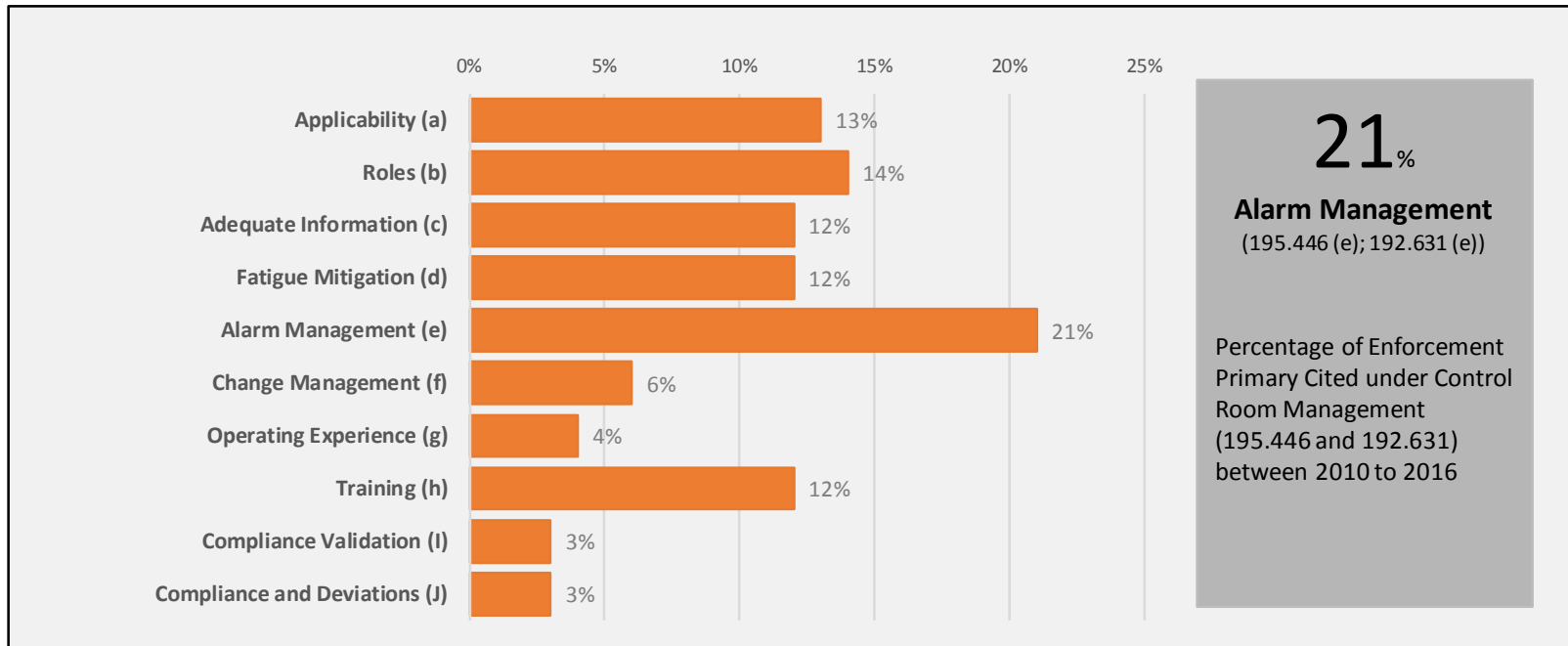
Alarm Management

Drilling down into Alarm Management, the majority (11 out of 17 violations) were related to not following written procedures

Alarm Management Violation Group	# of Total Items	Total Penalty Amount	# of Causal Items	# of Severity Items	Not follow procedure
Failed to notify appropriate emergency personnel	4	$400,000		4	4
Failed to take necessary action	4	$400,000		4	3
Failed to remediate known condition within reasonable time	3	$300,000		3	1
Inadequate response to emergency	1	$600,000		1	
Failed to respond creep alarm	1	$123,800		1	
Unqualified Pipeline Controller	1	$100,000		1	1
Inadequate response to unintended shutdown	1	$100,000		1	1
Inadequate response to pressure alarm	1	$100,000		1	1
Inadequate communication system	1	$100,000		1	
Grand Total	**17**	**$2,223,800**		**17**	**11**

Control Room Management – All Enforcement Actions

Control Room Management Enforcement (2010 – 2016)

In reviewing the complete federal enforcement database for the total number (not just those determined to be causal factors or those that increased the severity of incidents) of Control Room Management violations **under 192.631 and 195.446**, Alarm Management was similarly found to be the most commonly cited Control Room violation

Category	Percentage
Applicability (a)	13%
Roles (b)	14%
Adequate Information (c)	12%
Fatigue Mitigation (d)	12%
Alarm Management (e)	21%
Change Management (f)	6%
Operating Experience (g)	4%
Training (h)	12%
Compliance Validation (I)	3%
Compliance and Deviations (J)	3%

21%

Alarm Management
(195.446 (e); 192.631 (e))

Percentage of Enforcement Primary Cited under Control Room Management (195.446 and 192.631) between 2010 to 2016

Data based on Enforcement Items (2010 – 2016)
- Control Room Cited Regulation 195.446; 195.402(c)(15); 192.605(b)(12); 192.631
- # of Item: Enforcement Item contain Control Room Cited code (192.631 or 195.446 (a) - (j) either itself or related to procedural
- Related: Enforcement Item contains Control Room Cited code (192.631 or 195.446 (a) - (j) with other cited regulation

Control Room

New regulations regarding training for control room personnel [1]

[1] Federal Register / Vol. 82, No. 13 / Monday, January 23, 2017 / Rules and Regulations
192.631(h)(6) and 195.446(h)(6) Control room management - Operators must comply with the team training requirements under this paragraph no later than January 23, 2018.

Damage Prevention Violations

Damage Prevention

- Eight violations identified as causal factors

- Seven of these related to not following procedures; one related to an insufficient procedure

- Six related to temporary line marking activities

High Risk Activities

Analyzed enforcement data suggests the following may be high risk activities:

- **Hot Work** (for both hazardous liquid and gas transmission systems)

- **Valve Lockout/Tagout** (for hazardous liquid systems)

- **Alarm Management** (for hazardous liquid systems)

- **Temporary Line Marking** (for both hazardous liquid and gas transmission systems)
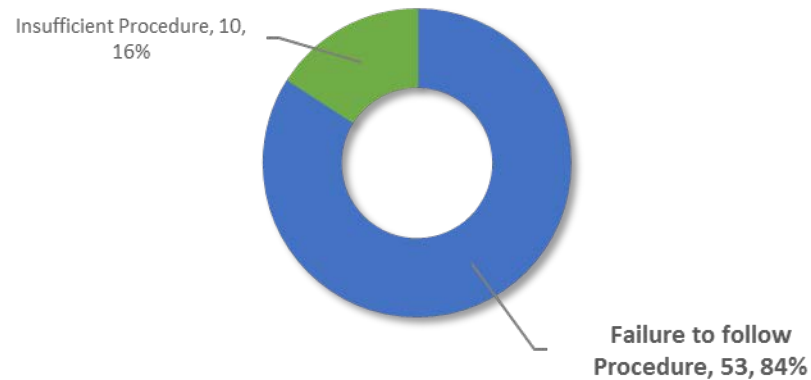
Procedural Violations

Procedural Violations

Procedural Violations

Out of the 79 enforcement items reviewed, 63 involved procedural violations.

- 53 (84%) – Failure to follow procedure.

- 10 (16%) – Insufficient procedure.

Procedural Types

Insufficient Procedure, 10, 16%

Failure to follow Procedure, 53, 84%

Employees vs. Contractors

(Procedural Violations)

| CLASSIFICATION	SUBCLASSIFICATION	Employee	Operator and Contractor	Contractor
Control Room	Alarm Management	9		
	Misc Control Room Management	3		
Corrosion Control	Atmospheric Corrosion	2		
	External Corrosion	1		
	Internal Corrosion	2		
Damage Prevention	Temporary Line Marking	4	1	
	Spotter			2
Maintenance / Repair	Equipment Management	2		
	Hot Work Activities	5	5	2
	Misc Maintenance/Repair		1	
	Recurrence Prevention	1		
	Tank Management	2		
	Valve Maintenance/Repair	5	3	
Operations	Tank Management	1		
Nondestructive testing	Welding Examination			1
Total		**37**	**10**	**5**

Note: API's Pipeline Performance Tracking System Operator Error Data Advisory reported that "… incidents are just as likely to involve contractors as direct employees."

Covered Tasks

(Procedural Violations)

Covered task and failure to follow procedure

- 45 out of 53 failure-to-follow procedure violations, involved covered tasks.

Procedural Types by Covered Task
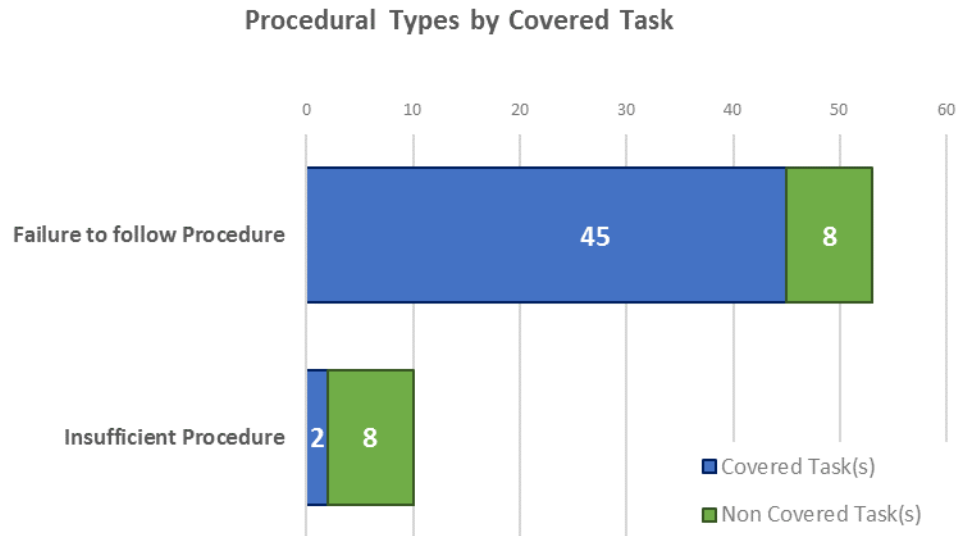
Procedural Violations

(Procedure Involving a Covered Task)

- Alarm Management had the most procedural violations involving covered task which were causal to or increased the severity of an incident.

Failure to Follow Procedure Involving a Covered Task		# of Items
Control Room	Alarm Management	11
	Misc Control Room Management	1
Corrosion Control	Atmospheric Corrosion	2
	Internal Corrosion	2
	External Corrosion	1
Damage Prevention	Temporary Line Marking	5
	Spotter	2
Maintenance / Repair	Hot Work Activities	9
	Valve Maintenance/Repair	6
	Equipment Management	2
	Recurrence Prevention	1
	Tank Management	1
Operations	Tank Management	1
Nondestructive Testing	Welding Examination	1

Procedure Violations with Covered Tasks in many instances involved:

- Improper temporary line marking

- Failed to monitor combustibles

- Failed to complete lock out/tag out

- Failed to properly respond to alarms

- Failed to notify appropriate emergency personnel

- Inadequate coating

Operator Qualification Violations

Three Violation Items specifically cited Operator Qualifications

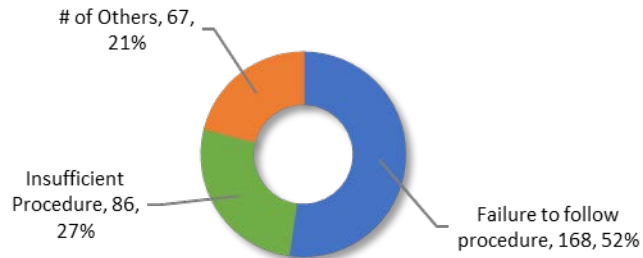| Category	Violation Description	Causal /Increased Severity
Control Room	Unqualified control room operator performed covered tasks (operating a pipeline) without direct observation by a qualified individual.	Increased Severity
Damage Prevention	The operator failed to ensure that the person designated as the Spotter was qualified or that he was directed and observed by an individual that was qualified.	Causal
Maintenance / Repair	Failed to follow Operator Qualification Plan by allowing 1) unqualified personnel to perform Covered Tasks (Atmospheric Monitoring), 2) failing to identify and verify the applicable Covered Tasks for contractor personnel for the Request for Service (RFS) covering the work being performed at the time of the accident; 3) failing to ensure contractor personnel were properly qualified for the covered tasks being performed; and 4) failing to have a Covered Task for the Installation and Use of Vapor Barriers.	Causal

Incidents Caused by Incorrect Operation

(Data based on Hazardous Liquids Incident Reports and Gas Transmission/Gathering Accident Reports)

Between 2010 and 2016, operators reported there were 425 hazardous liquids and gas transmission/gathering incidents caused by incorrect operation, of which 321 involved procedures. Operators reported:

- 168 – Failure to follow procedure
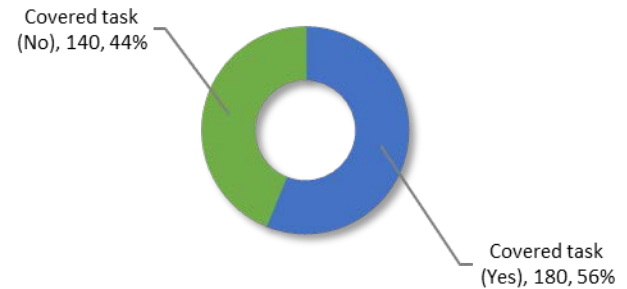- 86 – Insufficient procedure

Operators also reported that of the task that led to the incident:

- 180 – Covered Task
- 140 – Not Covered Task

Of the 180 covered tasks, operators reported that:

- 170 – Individual qualified or directed by a qualified individual
- 10 – Individual not qualified

Hazardous Liquid Pipeline and Gas Transmission/Gathering Accident/Incident Reports for 2010 - 2016 caused by Incorrect Operation

# of Others, 67, 21%

Insufficient Procedure, 86, 27%

Failure to follow procedure, 168, 52%

Data based on Incident/Accident report form question:
G7 #3: Was this Accident related to: (select all that apply)
Insufficient Procedure: Inadequate procedure and/or No Procedure established
Failure to follow procedure: failure to follow procedure excluding insufficient procedure
Other: Other excluding sufficient procedure or failure to follow procedure

Hazardous Liquid Pipeline and Gas Transmission/Gathering Accident/Incident Reports for 2010 - 2016 caused by Incorrect Operation

Covered task (No), 140, 44%

Covered task (Yes), 180, 56%

Data based on Incident/Accident report form question:
Was the task(s) that led to the Accident identified as a covered task in your Operator Qualification Program?

API's Pipeline Performance Tracking System
Operator Error Data Advisory
Management Best Practices

- "Focus should remain on reviewing and updating procedures to ensure that they remain accurate and relevant for these tasks as 62% of incidents occurred during normal operations and maintenance activities."

- "Focus should remain on effective training programs for employees to provide them the knowledge and skills needed prior to performing job tasks and at periodic intervals to ensure retention as 79% of incidents identified failure to follow procedure as the cause. Deviations from established procedures should be reviewed. Planned deviations should follow a process to allow for review and approval."

Pipeline Safety Management Systems
ANSI/API Recommended Practice 1173

8.1 Operating Procedures

8.1.1 General

The pipeline operator shall maintain procedures that address safe work practices to assure the safe conduct of operating, maintenance, and emergency response activities and the control of materials that impact pipeline safety. **Pipeline operating personnel shall follow written procedures. In cases where an employee believes that following a procedure will cause an unsafe condition, he/she shall have authority to stop work and seek permission to deviate. Deviations should be documented for future analysis.** Pipeline operating personnel shall have responsibility and authority to raise concerns through designated processes.

Rules to Remember

The data suggests the regulatory community should pay extra attention to the following Citations, in regards to Hot Work, Alarm Management, Valve Lockout/Tagout, and Temporary Line Marking activities:

§195.401   Operation and Maintenance: General requirements (Repairs)

§195.402 / §192.605   Operation, Maintenance and Emergency

§195.408   Communication system

§195.422   Pipeline Repairs

§195.442/ §192.614   Damage Prevention

§195.446   Control Room Management

§192.751   Prevention of Accidental Ignition

§192 N / §195 G   Qualification Program

Enforcement Data Also Suggests

In addition to complying with the minimum federal pipeline safety standards, in the case of conducting Hot Work, Valve Lockout/Tagout, Alarm Management, and Temporary Line Marking activities, operators should:

- Maintain clear, easily understandable, updated, and accurate procedures

- Ensure that procedures consistently followed by operator personnel and contractors

- Document and review deviations from procedures

Additional Questions / Comments?

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Safety Administration