



SOUTHWEST GAS CORPORATION

Incident Investigations

Incorporating metering technology as part of investigations



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Who we are....

- Eric Crow, IAAI-CFI



Southwest Gas
founded in 1931



2,227
employees



1,417 miles

of transmission main

2.18 million
customers

1 billion
cubic feet
capacity
LNG
storage
facility

55,700 miles

of main and service

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Natural Gas Incidents

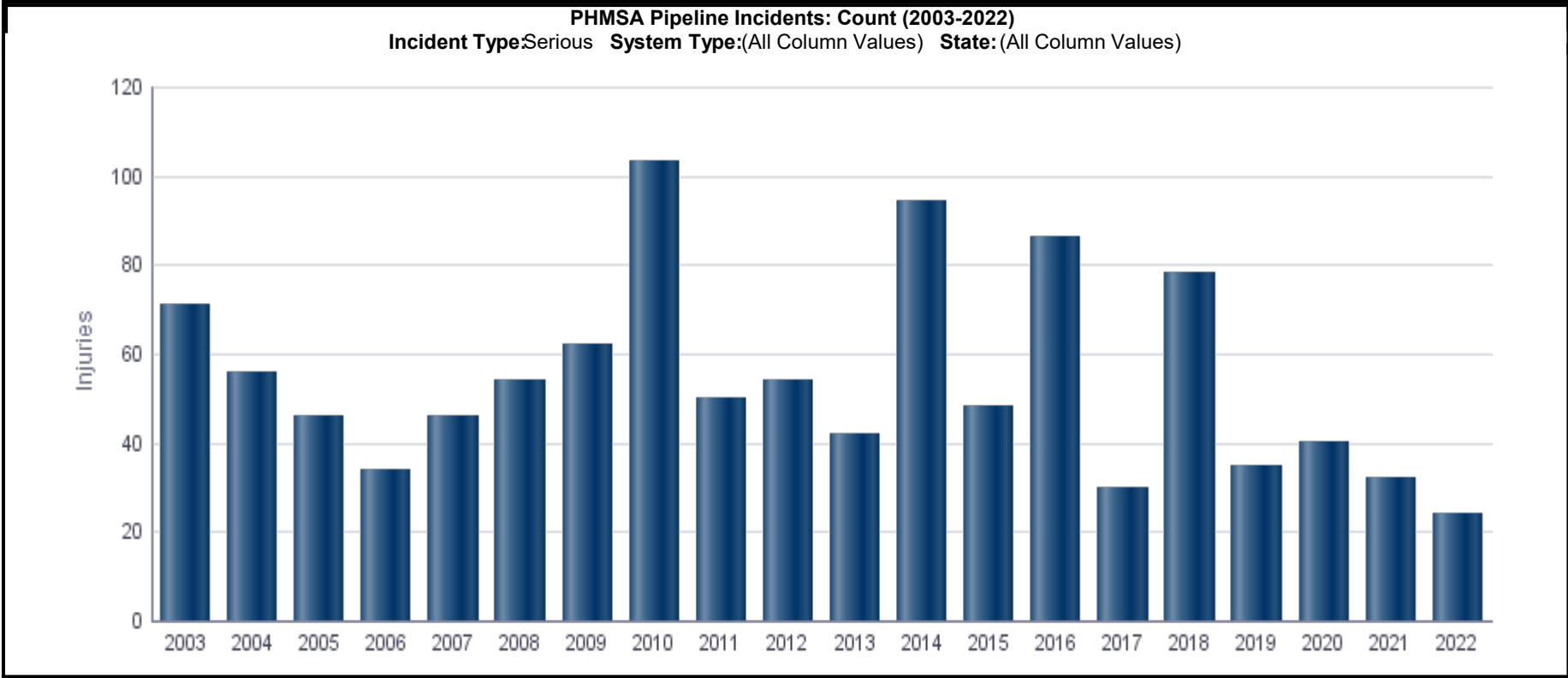
Types of Natural Gas Incidents

- Energy Theft
- Customer complaints
- Facility damages
- Fires & Explosions



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Natural Gas Incidents



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Natural Gas Incidents



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Guidelines for Investigations

- NFPA 921 Guide for Fire Investigations
- NFPA 54 Fuel Gas Code
- ASTM standards
- Investigation Essentials
 - Underground Leak Surveys
 - Meter (Clock) Test /Pressure drop test
 - Pressure Test (Underground Service Line)
 - Odorant Test
 - Leak flow test (Houseline)
 - Appliance inventory



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- BTU - Cubic Feet (CF) - Therm
- Common Gas Appliances
 - Furnace - 100,000 BTUs/hr – 100 CFH – 1 therms
 - Range/Oven - 35,000 BTUs/hr – 35 CFH - 0.35 therms
 - Water heater - 40,000 BTUs/hr – 40 CFH – 0.40 therms
 - Clothes Dryer - 22,000 BTUs/hr – 22 CFH – 0.22 therms
 - Tankless water heater - 200,000 BTUs/hr – 200 CFH – 2 therms
 - Pool heater - 400,000 BTUs/hr – 400 CFH – 4 therms



Guidelines for Investigations

How can metering technology aid investigations?

- Record normal consumption
- Record abnormal consumption
- Provide historical usage data
- Houseline conditions
- Revolutions vs. CFH



Guidelines for Investigations

Meter Technology

- 40G
- 100G
- 500G
- Intelis



Guidelines for Investigations

- 40G technology
 - Not data logging
 - Stores current index data
 - Customer usage
 - Handheld readings

What the 40G can reveal to an investigator.



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Guidelines for Investigations

- 100G & 500G Technology
 - Data logging
 - Stores current index data
 - 40 days of customer hourly usage
 - Handheld & Remote readings



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Guidelines for Investigations

- Intelis Meter Technology
 - Data logging
 - Stores current index data
 - 40 days of customer hourly usage
 - Can provide 5-minute interval readings
 - Handheld & Remote readings
 - Auto shut off
 - Testing



ERT Technology & Process Implementation

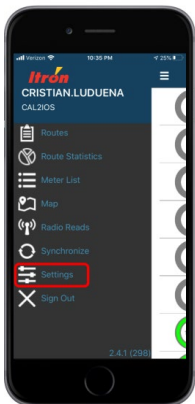
- Importance of a process
- Consistency
- Verification
- Collection
- Preservation
- Analysis



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ERT Technology & Process Implementation

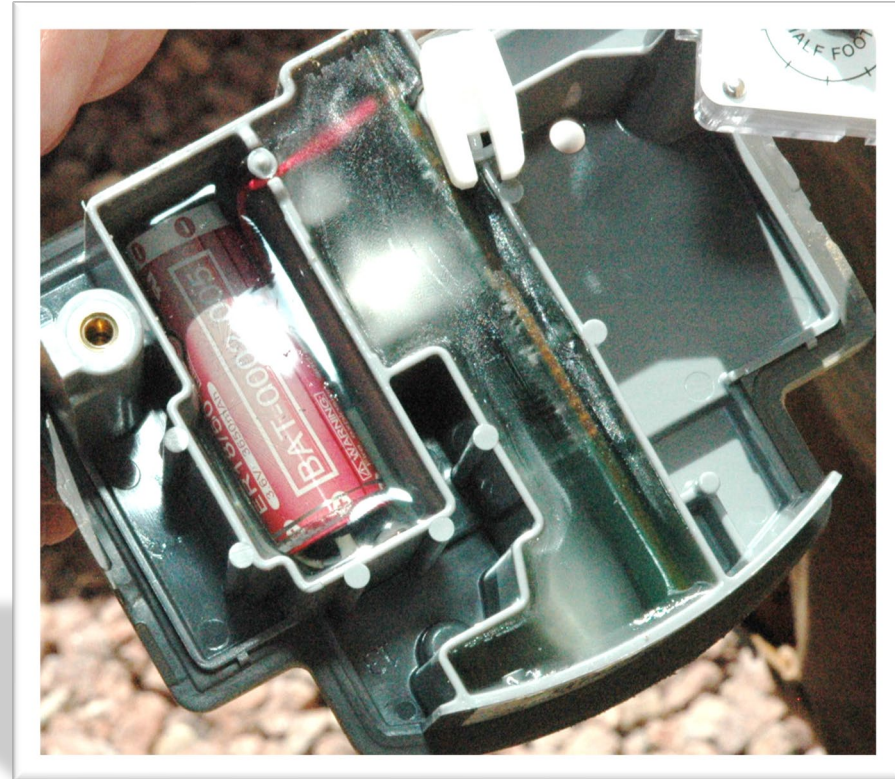
- Identifying the value
 - Company & Department Support
- Identifying stakeholders
 - Teams needed for implementation
 - IT, IS, Risk, Operations, Legal
 - External experts
- Download Process



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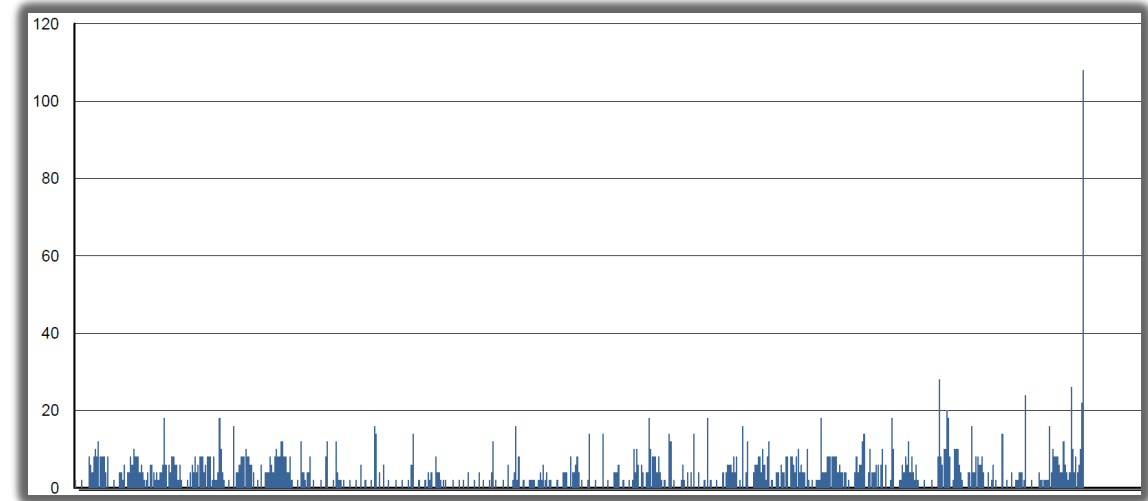
- Evidence Collection
 - Written procedure
 - Challenges
- Evidence Preservation
 - Handling
 - Storage
 - Documentation



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- Communication, Training and Education
 - Internal Stakeholders
 - Experts
 - External Fire Investigators
 - Joint scene inspection
 - Legal



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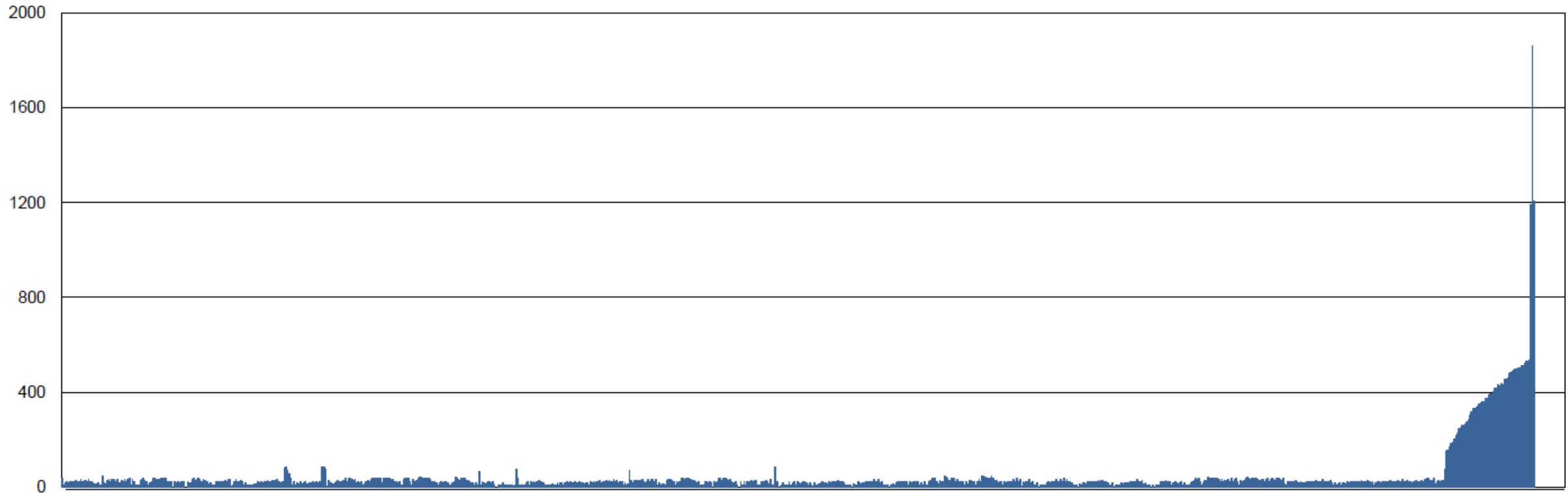
Challenges and Successes

- Understanding the technology
 - Correlating data to scene findings
 - Conversions
- Communication to stakeholders
- Communicating information to public investigators and interested parties
- Educating Staff – Management of change
- How to preserve the data



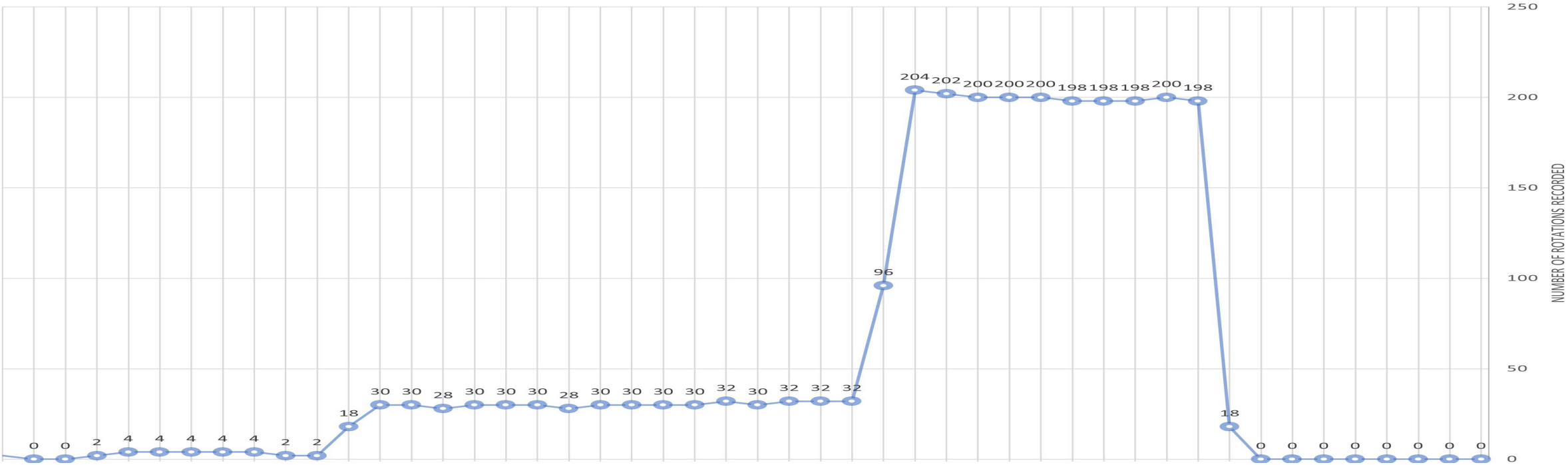
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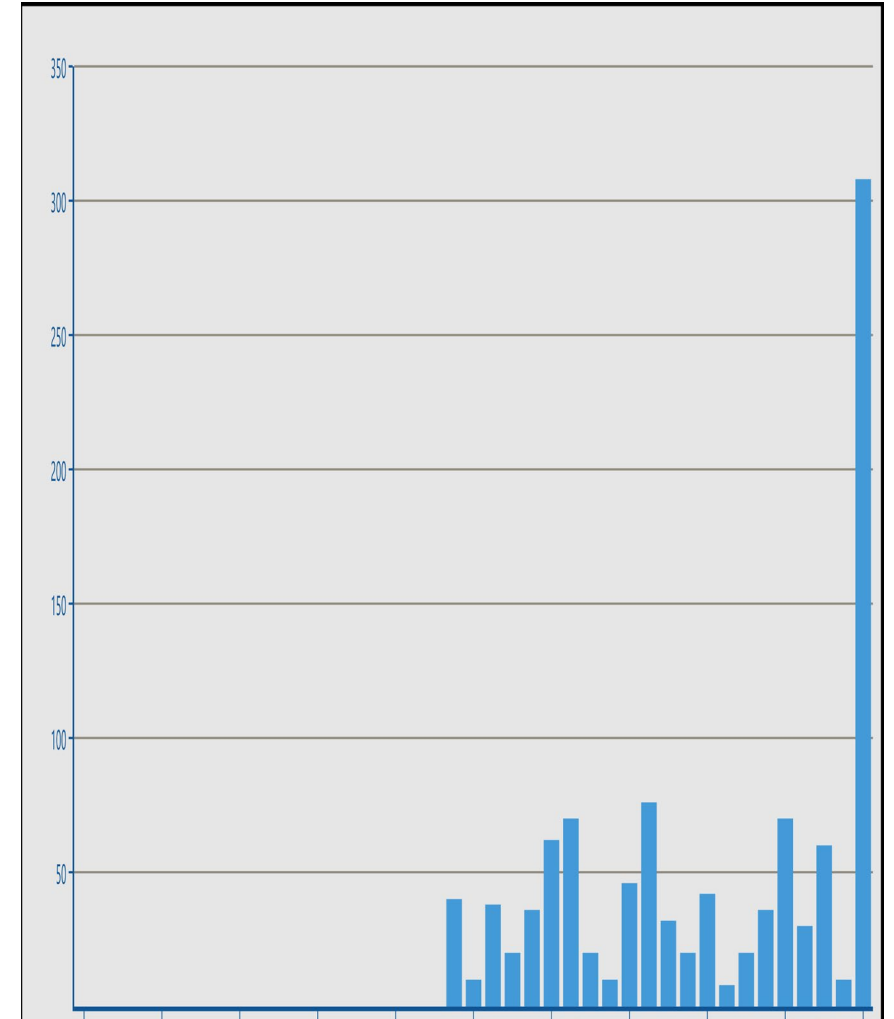
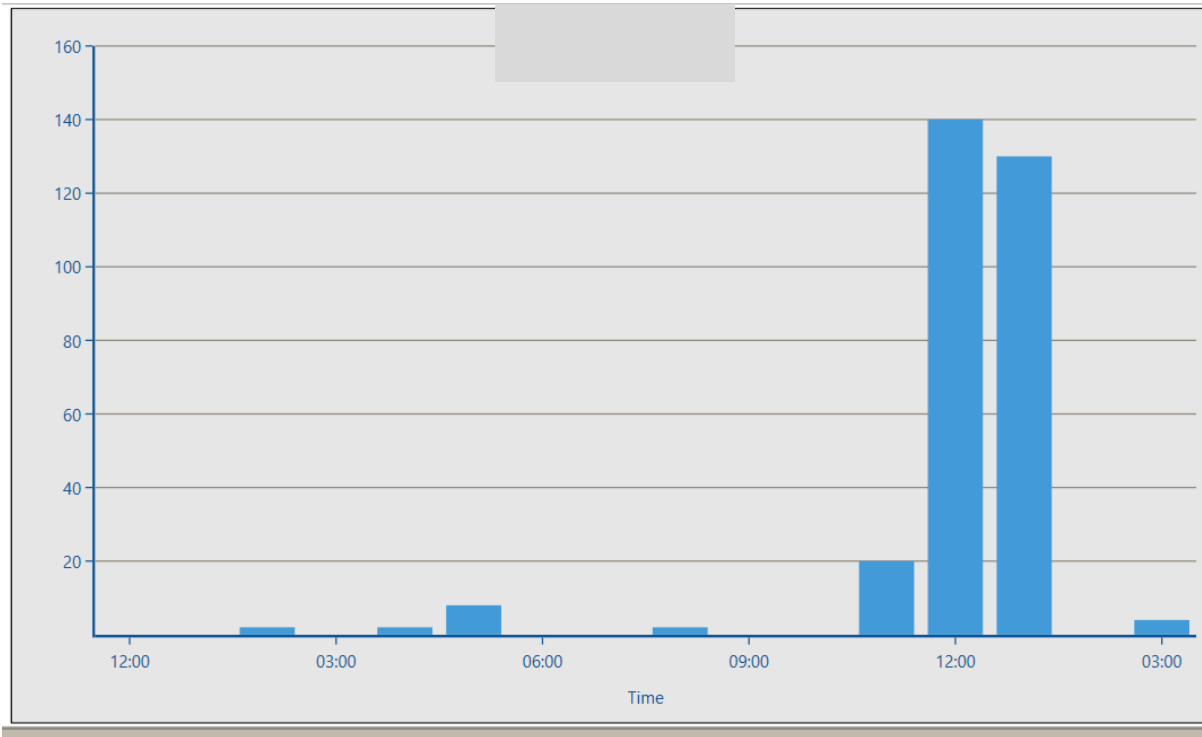


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- Graphs vs. Meta data
- Keeping meta data
- Data meaning
- Consistency

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Summary

- Types of natural gas incidents
- Resources for investigating incidents
- Use of ERT/data logging technology in investigations
- Understanding of ERT data
- Process implementation
- Challenges and solutions