ESRI EPUUG
2015 Novembre

Data Governance
What Hazard Studies Taught Us

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European gas pipeline systems

32,000 km (20k miles)
~ 4,500 feed points
~ 100 shippers
583 TWh transported
2 billion € revenue
~3,000 employees

ENGIE Subsidiary
Ensuring European and French natural gas supply

Source: Gas in Focus / ENTSOG (2011)
Agenda

1. Pipeline Hazard Studies
2. Data issues
3. Lessons we learned
2006/2014 Legislation

- Stricter design rules with respect to security
- Complete hazard studies every 5 years
- Yearly report through GIS DB
Roadmap

2006
GIS database
CAD plans publication

2010
Industrialization of data entry and publication module – “MICADO”

2012
Hazard study module “CESAR”
Detailed Planning – The tale of two cities

- GIS database
- CAD plans

Project Department

- 2010: MICADO
- 2012: CESAR

Asset Management & Operations

- 2006: Preparation of first Hazard Studies
- 2009: HS First delivery
- 2014: HS Second delivery

HS Tools “agile” development

Industrial Security Department
Pipeline hazard studies – Example

Pipe characteristics (ND, MAOP, etc.)
Pipeline hazard studies – Risk Analysis

Risk Matrix
Pipeline hazard studies – Compensatory measures

Concrete Slab

Strengthened surveillance

Allowance

Risk Reduction
Pipeline hazard studies – principles

Project

Public Authority Reporting

Every 5 year and on significant changes

Hazard Studies

Adaptation Program

Environmental Data

Asset & Regulatory Data

MICADO

CESAR

Public Authority Reporting

(Semi-)Formalized Data Flow

To be formalized Data Flow
(Half-)Success story

- Meet the regulatory constraints
  - Main goal → Was a definite success

- Leverage produced data to empower operations
  - Goal was set but abandoned
  - Issues were not identified
  - Implicitly left as a legacy to the current organization
Agenda

1. Pipeline Hazard Studies
2. Data issues
3. Lessons we learned
Pipeline hazard studies – principles

- Project
  - Public Authority Reporting
    - Hazard Studies
    - Adaptation Program
      - Environmental Data
    - CESAR
  - Asset & Regulatory Data
    - MICADO
    - Every year
    - (Semi-)Formalized Data Flow
    - To be formalized Data Flow
  - Public Authority Reporting
    - Every 5 year and on significant changes
Addressed subdomain

Project

Public Authority Reporting

Every 5 year and on significant changes

Hazard Studies

Adaptation Program

Asset & Regulatory Data

Environmental Data

Every year

Public Authority Reporting

(Semi-)Formalized Data Flow

To be formalized Data Flow
Data circuit

- Hazard Studies
- Risk Analysis
- Computation Data
- Regulatory Data
- Adaptation Program
- Data Collection
- Asset Data
- Pipe Data
- Appurtenance

ICM
PCM

ESRI European Petroleum User Gas – London 2015
Data mayhem – Publication Issues

- Hazard Studies
- Computation Data
- Risk Analysis
- Regulatory Data
- Adaptation Program
- Data Collection
- Asset Data
- ICM
- PCM
- Pipe Data
- Appurtenance
Publication issues – changing worlds

H. Studies Programming
2013

Data Extraction → Risk Analysis → Project PCM

Regulatory Treatment Program
Public Office Delivery
2014 H. Studies
2015

Validated PCM

Publication

Hazard Study world - CESAR
Linear Asset description - MICADO

Network Evolution

ESRI European Petroleum User Gas – London 2015

GRTgaz – Data Governance and Hazard Studies – Marc DEVELEY
A very complex publication process

Risk Analysis Data → Selection

- Data used for validated risk analysis

Consolidation → Integration

- Data Simplification
- Projection on current geometry and fusion

« CESAR »

« MICADO »
Data mayhem – Some publication issues

- How to control complexity of stratified hazard study data?
  - Complex derivation of integrated data from h.s. data
  - Errors are hard to detect
  - Leads to complex validation process

- What should we do when integration is not possible?
  - What is a proper critical distance?
  - Should hazard studies be reprogrammed and when?
  - Possibility of preventing misprojections (early warnings?)

- Hard to explain → IT got it wrong the first time
- Paying the complexity price of disconnected production / publication processes
Data mayhem – CM Issues

- Hazard Study
- Risk Analysis
- Computation Data
- Regulatory Data
  - PCM
  - ICM
- Asset Data
- Adaptation Program
- Data Collection
  - ICM
  - Pipe Data
  - Appurtenance
Data mayhem – CM issues

Regulatory Adaptation Program

2009 H. Studies

Proposed CM

Feasibility

“Planned” CM

Operational CM

Operational ICM
- Surveillance
- Information
- ...

Construction ICM
- Mechanical Protection
- Marker Tape
- ...

Operational Adaptation Program

Implemented CM

Implementation

2014 H. Studies

Reinitialized
Data mayhem – CM issues

Regulatory Adaptation Program

2009 H. Studies

Proposed CM

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Operational Adaptation Program

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Reinitialized

Reused

2014 H. Studies
Data mayhem – CM issues

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Reinitialized

Reused
Feasibility may induce changes in PCM

- Should the feasibility process be mirrored in specific (new) data such as “Planned” CM?
- Should a PCM defined before or after feasibility?
- What exactly should be transmitted, and when, to public agencies?

Paying the price of not fully correlating data production with final processes (and insufficient definition sharing)
Data mayhem – CM issues

Regulatory Adaptation Program

2009 H. Studies

Proposed CM
Feasibility

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Operational CM
Implementation

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Reinitialized

2014 H. Studies

Reused

PCM

RCM
How should Operational ICM data be managed?

- We “discovered” in 2015 that they should be reinitialized…
- … and we still are to finalize the update process definition

Paying the price of not defining data complete life cycle in final processes
Data mayhem – CM issues

Regulatory Adaptation Program

2009 H. Studies

Proposed CM
Feasibility

Operational Adaptation Program

“Planned” CM
Implementation

Operational ICM
- Surveillance
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- ...

Implemented CM

Construction ICM
- Mechanical Protection
- Marker Tape
- ...

Reinitialized

Reused
How should Construction ICM data be managed?

- Definition issue: misunderstanding between construction ICM and the actual appurtenances in the Risk Analysis tools
- Induces extra gesture to qualify non ICM slabs (eg) as ICM
- Induces a data semantic flaw

Paying the price of insufficient definitions and no clear data responsibility
Data circuit – issue overview (simplified!)

- Hazard Study
- Risk Analysis
- Computation Data
- Regulatory Data
- Adaptation Program
- Data Collection
- RCM
- Pipe Data
- Appurtenance
- Asset Data
- ICM
- PCM
- Regulatory Data
- Pipe Data
- Appurtenance
Agenda

1. Pipeline Hazard Studies
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What we did well

- Deliver an efficient Linear Asset Description tool
  - Separating Collection from Usage…
  - … and defining clear responsibilities and animation
- Devise functional hazard study tools…
  - Complying with the law…
  - … on a very tight schedule
- … using enterprise data asset
  - Without disturbing collection processes
- … and devising some collection processes for new data
What we could have done better

- **Design data supply chains as early as possible**
  - “We will have time to think about this later on”… Indeed!
  - *The early bird catches the worm:* teach business how to design ahead of (its) immediate use

- **Emphasize definitions**
  - *Knowledge is power:* define terms, ensure adequacy, and share!
  - Be as versatile as data is: through the processes tough skins

- **Treat all data processes as mandatory deliverables**
  - *No such thing as a free lunch:* Definitions and rules have strong impacts on business!
  - ⇒ Process adaptation is not “mere” change management
One reason why we failed

- GIS database
- CAD plans
- Publication

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- "CESAR"
- HS Tools “agile”"development

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2006:
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Asset Management & Operations
GIS & Data knowledge
"MICADO"

GIS database
CAD plans publication

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Preparation of first Hazard Studies
Mirandian “brave new world” vision

- Preparation of first Hazard Studies
- HS First delivery
- HS Tools “agile” development
- “CESAR”
- HS Second delivery
- Project Department
- Data Gov. Office

- Asset Management & Operations
- GIS & Data management
- GIS database
- CAD plans publication

- 2006
- 2009
- 2010
- 2012
- 2014

- “MICADO”
Fixing problems – 2016... 2019?

- Define data and data supply chains
  - Produce and promote the rules in and out hazard study data must obey

- Redesign Hazard Study Workflow
  - Production – Publication delay
  - Hazard Study black box must become semi-transparent

- Harmonize Reportings
  - Ensure no discrepancy between datasets

- Extend Best Practice to Facility Hazard Studies
Preventing problems (while fixing them 😊)

- **Formalize data accountability & responsibility**
  - Each (important) data should be given an owner and a steward...
  - ... in charge of data business adequacy, definition and quality, etc.

- **Formalize (in)formation towards all data stakeholders**
  - Data should be a shared concern

- **Promote metadata and DQA**
  - Build, share and manage knowledge about data & data quality

- **Understand & control linear geographical data specificity**

So... Let’s treat data as assets!
Thanks for attending!

Do you have any questions?