Oil and Gas Production Emissions

A view from the trenches

Jack Matthews
Associate Engineer
Cordilleran Compliance Services, Inc.

Introduction

B.S. Chemical Engineering, University of Idaho, 1987

Chevron Corporation –

Process Engineer – Richmond, CA ’87-’88

Chemical & Corrosion Engineer – Rangely, CO ’88-’92

Environmental Specialist – Houston, TX and Rangely, CO ‘92-’96

Process Engineer – Cabinda, Angola ’96-98

Project Engineer – Nigerian Business Unit ’98-’02

Cordilleran Compliance Services, Inc. 2002 – Present

Associate Engineer – Environmental Compliance, Permitting and Regulatory Support – “Jack” of all trades, master of none

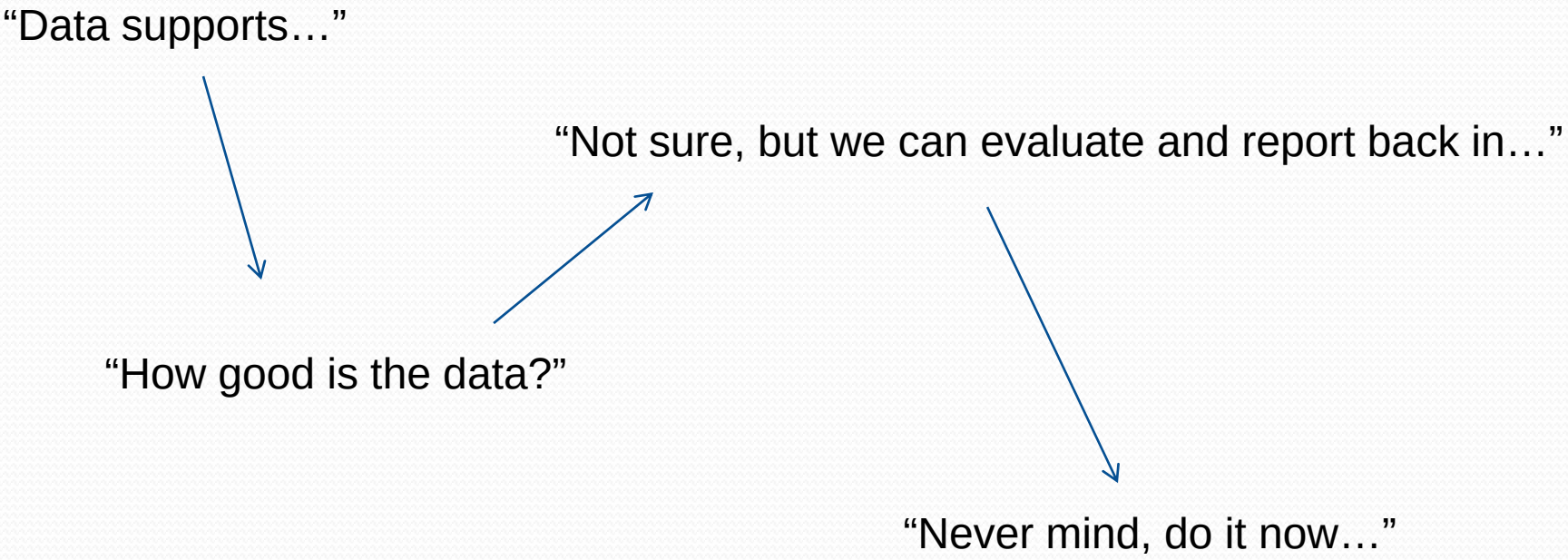
My Top Frustrations

- Data
  - Absence of appropriate data – leading to overuse of SWAGs and the AE Tables
  - Lack of understanding of simplifying assumptions
  - “Any number is a good number” attitude
  - Polished and glossy = credible

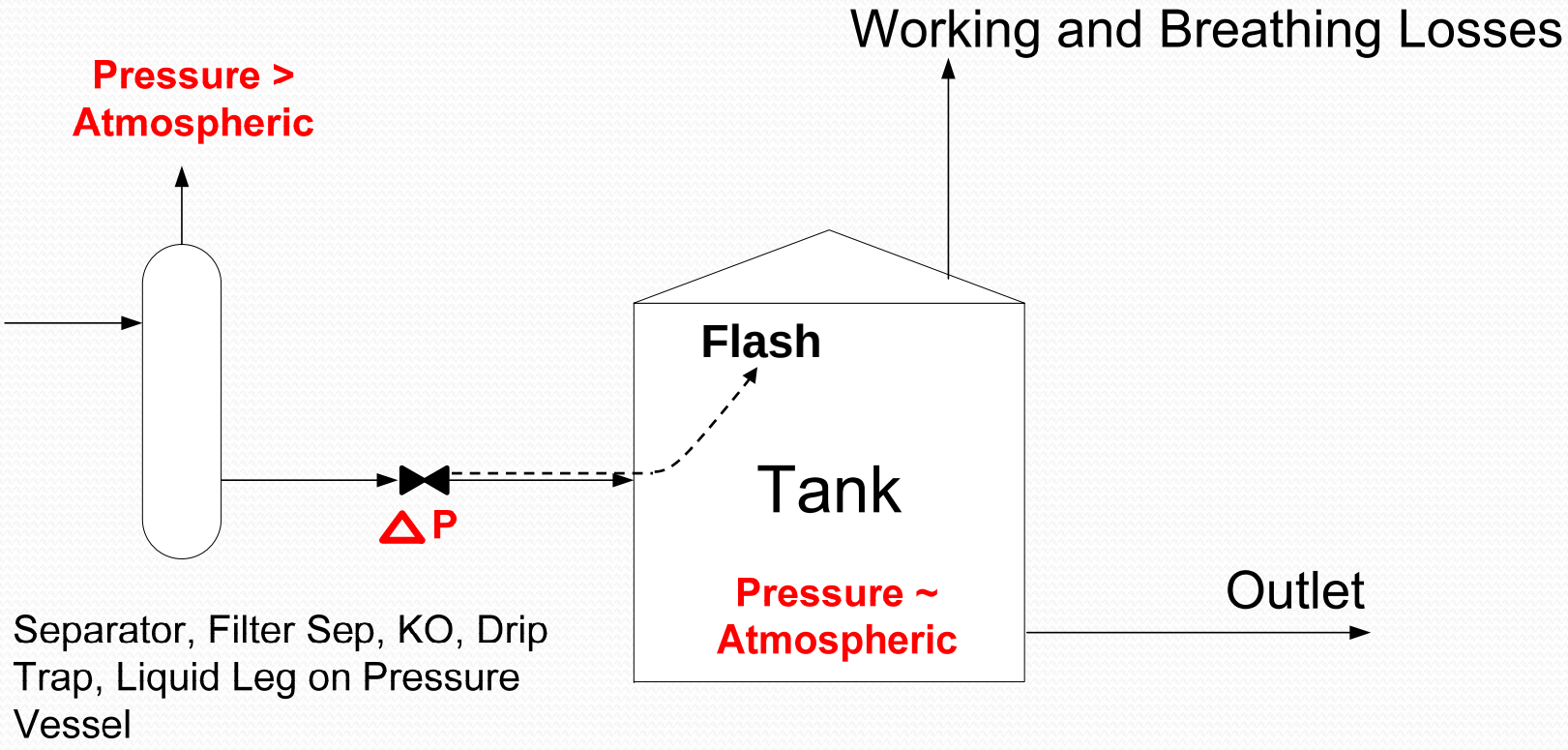
My Top Frustrations - 2

- Balance between ‘doing it now’ vs. ‘doing it right’
  - This balance is the primary goal of Major Capital Project teams
    - 80/20 rule
    - Value of information / cost – benefit analyses
  - Impacts industry, regulators, NGOs, politicians, etc.
  - Pressure from stockholders, public, managers, and American culture favor “Do it NOW”

Links


"Data supports…"
"Not sure, but we can evaluate and report back in…"
"How good is the data?"
"Never mind, do it now…"

Anecdotal Example – Data Quality Flashing Emissions



Anecdotal Example – Data Quality Flashing Emissions

- **Estimates of uncontrolled emissions –**
  - **Method 1 – 1825 TPY**
  - **Method 2 – 504 TPY**
  - **Method 3 – 165 TPY**
  - **Method 4 – 92 TPY**
  - **Data Point 5 – 2 TPY; Previously reported emissions based on bad data, poor assumptions, limited understanding, and no flash emissions**

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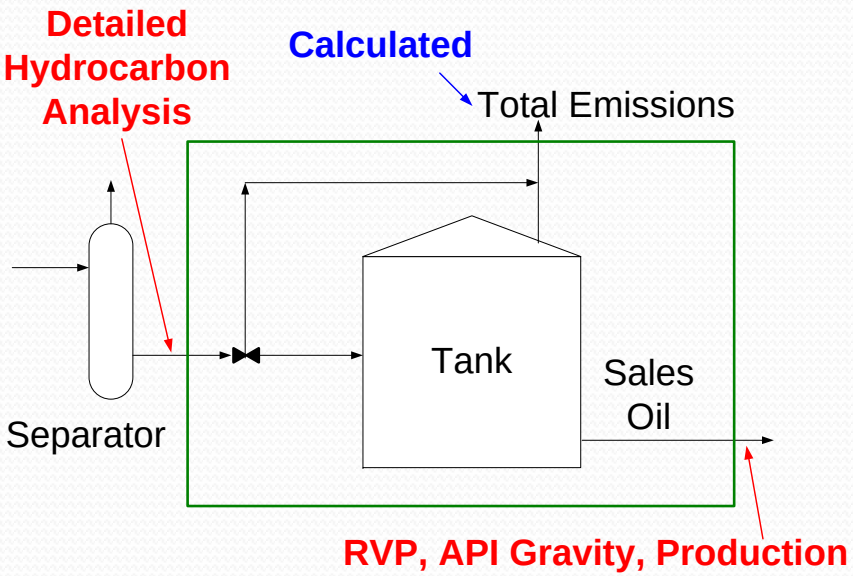
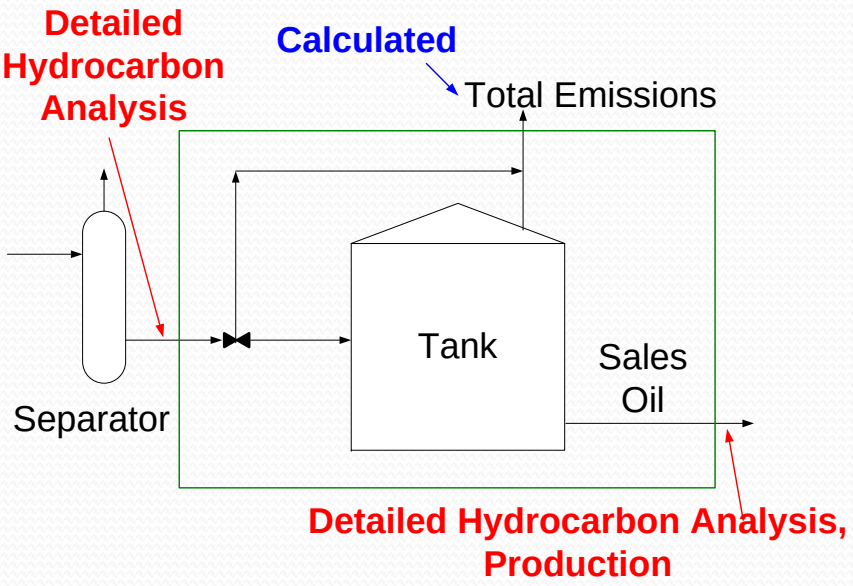


Conventional E&P Tank Methodology

Modified E&P Tank Methodology



Anecdotal Example – Data Quality Flashing Emissions

- **Estimates of uncontrolled emissions –**
  - **Method 1 – 1825 TPY**
  - **Method 2 – 504 TPY**
  - **Method 3 – 165 TPY**
  - **Method 4 – 92 TPY**
  - **Modified E&P Method – 45 TPY**
  - **Method 5 – 2 TPY; Previously reported emissions based on bad data, poor assumptions, limited understanding, and no flash emissions**

Suggestions From the Trenches

- Evaluate Data Quality for Critical Decisions
  - More ≠ Better
  - Understand sources and magnitude of data uncertainty
  - Identify potential data bias
- NOT Suggesting “Analysis Paralysis”
  - All decisions have elements of uncertainty
  - Good decisions can have bad outcomes and bad decisions can have good outcomes
  - Full disclosure of the nature and magnitude of data uncertainty so potential for bad outcomes is clearly understood
  - Find the balance between ‘do it now’ vs. ‘do it right’