MOL Exploration and production
2023 Incident review

Tank overfill (T-67) at Pft-6 Gathering station (Pusztaföldvár)

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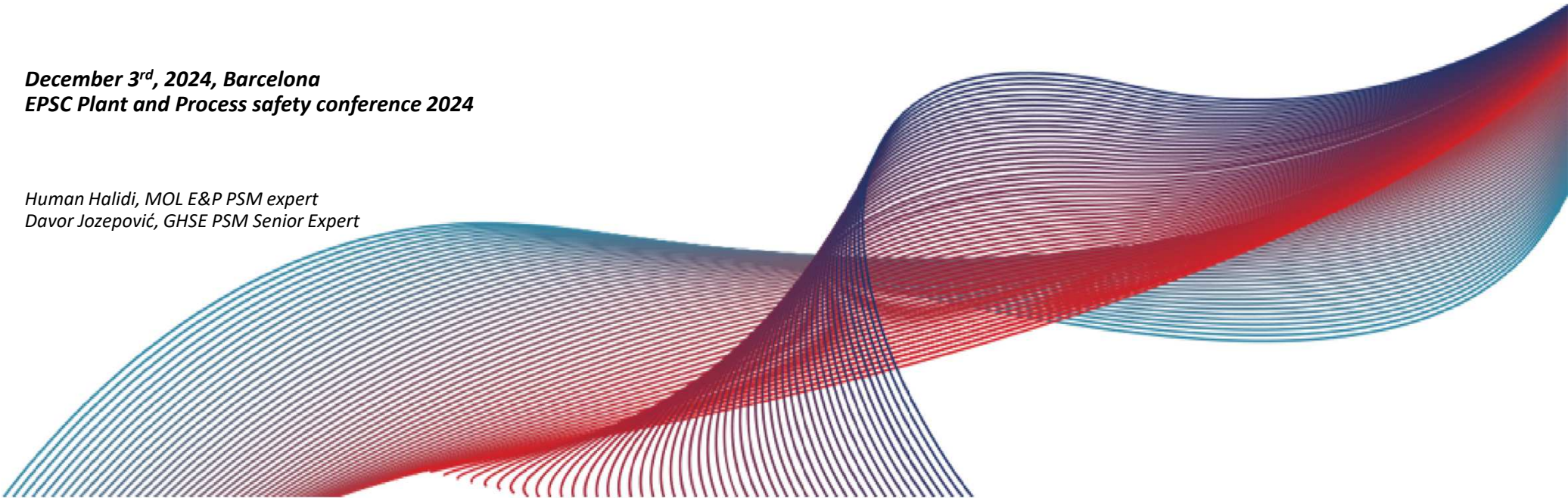


MOL GROUP IN BRIEF

INTEGRATED CENTRAL EUROPEAN MID-CAP OIL & GAS COMPANY

CORE ACTIVITIES

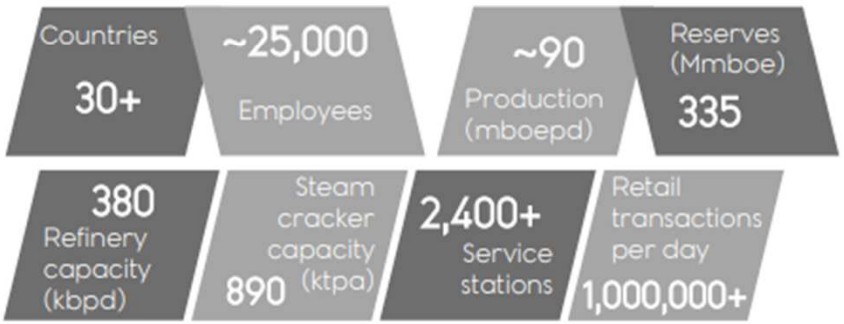
CLEAN CCS EBITDA BY SEGMENTS IN 2023 (USD MN)[1]

UPSTREAM	DOWNSTREAM	CONSUMER	GAS
953	1,328	695	265

KEY FIGURES

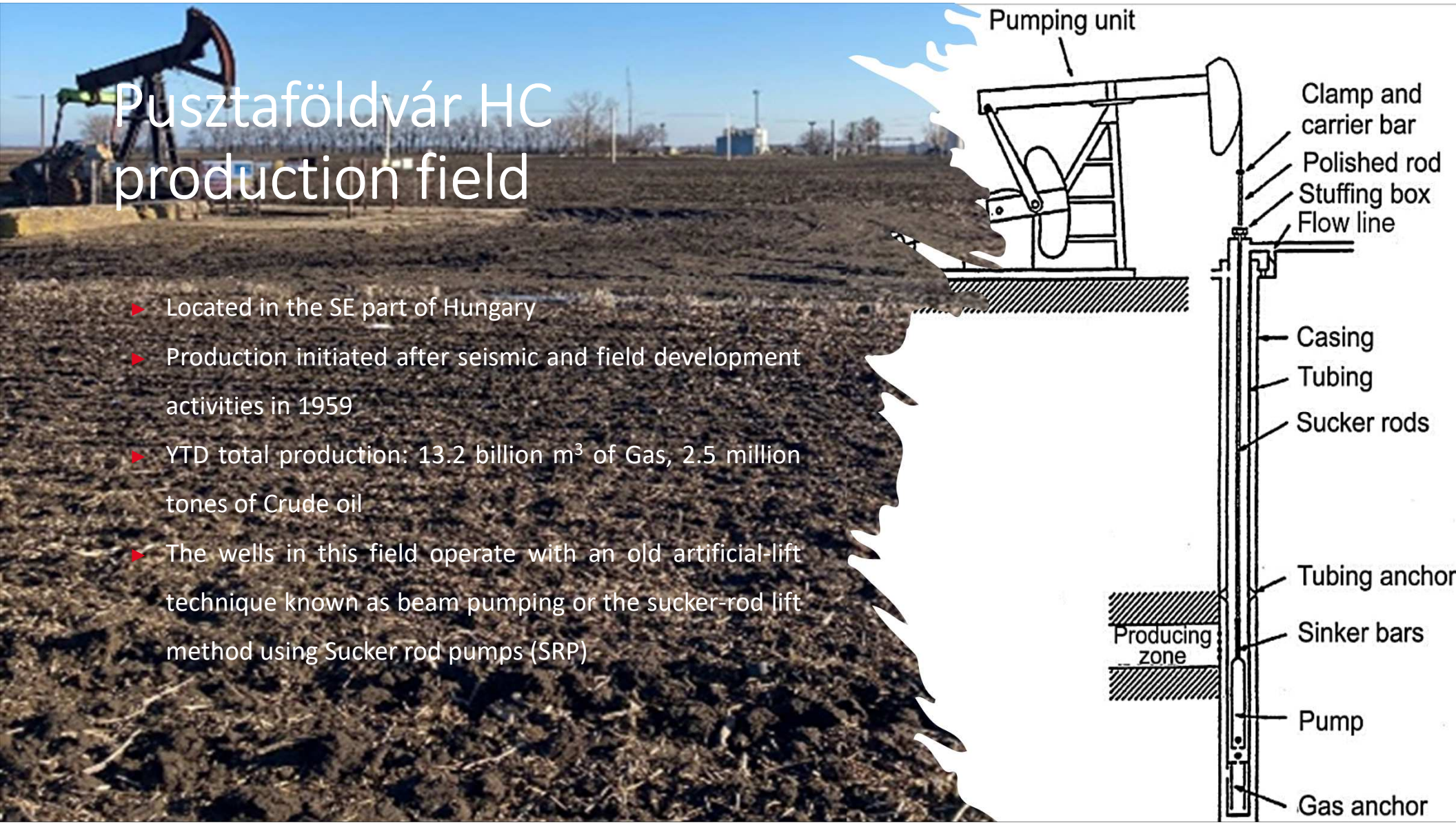
CAPITAL MARKETS

BUSINESS / ASSETS



Pusztaföldvár HC production field

- Located in the SE part of Hungary
- Production initiated after seismic and field development activities in 1959
- YTD total production: 13.2 billion m^3 of Gas, 2.5 million tones of Crude oil
- The wells in this field operate with an old artificial-lift technique known as beam pumping or the sucker-rod lift method using Sucker rod pumps (SRP)



Pft-6 Gathering station (Pusztaföldvár)

Production field operational information

Normal operation and production

- Operational set up for production is the active wells to be connected to the flow line towards the dispatch station
- Pft-6 contains of a measuring separator and 4 ($60m^3$) tanks
- Gathering station Pft-6 is operating without a permanent crew
- Indicators and alarms are transferred to the control room of the dispatcher to the central dispatching station

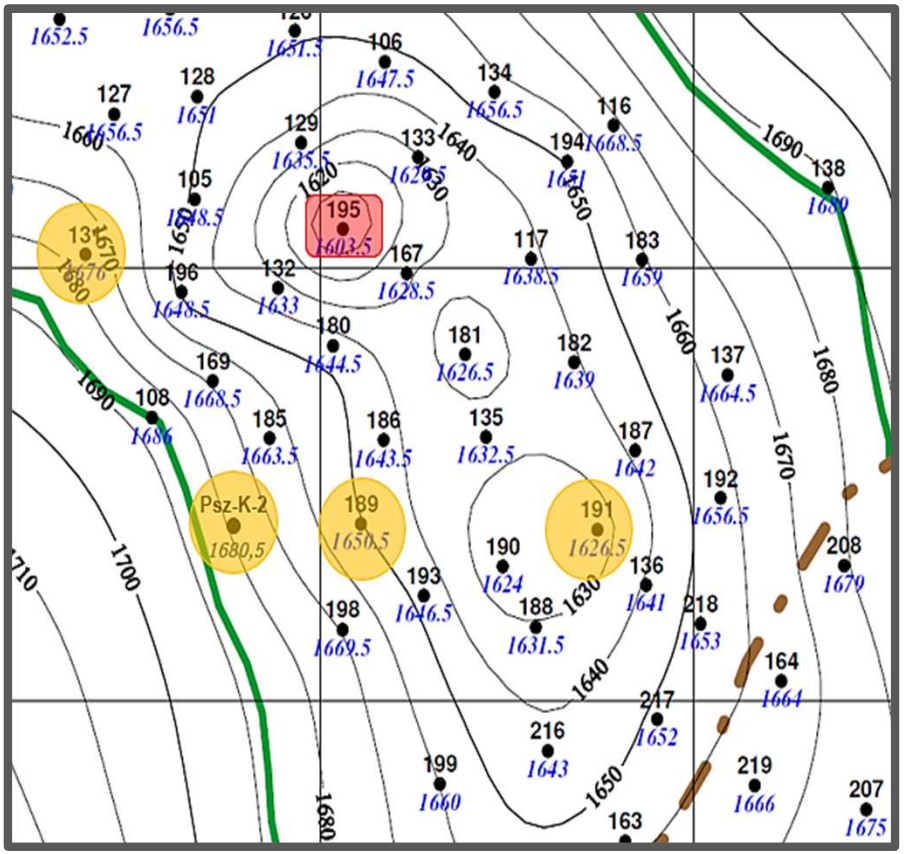
Average monthly production (m^3)

Total fluid production	Net crude oil	Net H_2O	Associated gas
31.000	667	30.000	356.470

Pft-6 Gathering station (Pusztaföldvár)

The production well shift/operational change

- Production based on the product content has potential of high paraffin depositions.
- Preventing the paraffin precipitation, in periods of well workovers the production tubing is washed out. Water is collected from high water content wells.
- In a well workover preparation at the Pft-6 the production is coming from well PF-191 (99.9% water content)
- Due to the SRP technical issues the production was shifted to the second highest water content producing well PF-195

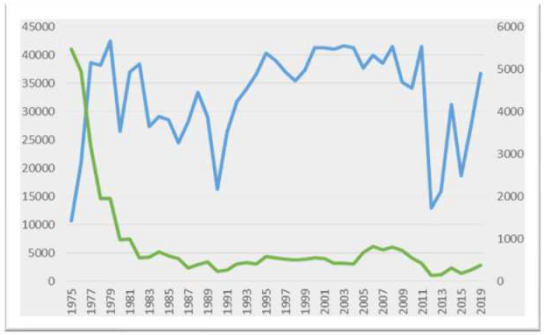


Incident background and description

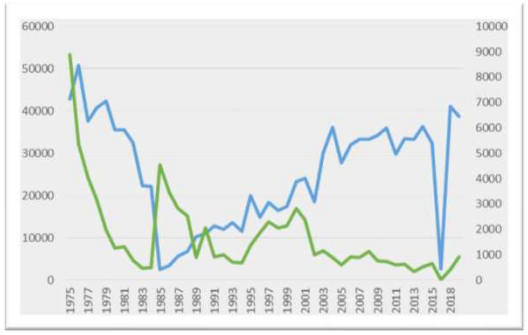
Background

- Tank T-67 already contained 5m^3 of produced crude at the time of connection, but field operators decided to monitor the production and filling of the tank managing the risks
- Well PF-195 had occasional inconsistent production which was a known characteristic
- Located at a high point of the reservoir cap due to gas "pocket" migration, occasionally experienced here, the gas moved to the well site location and pushed the fluids.
- This increased the pressure in the area and the well started to produce as a self-flowing well, with much higher rates
- Tank T-67 had only a high level alarm and no executive (SIS) function

PF-191 (m^3)



PF-195 (m^3)



Incident background and description

Incident description

- By the time the high-level alarm was triggered, T-67 reached 46m^3 (approx. 78%) of tank capacity
- The dispatcher received the alarm signal in the operating room of the remote Dispatch station at 1.35h and immediately informs the on-call field operator
- Due to the production characteristics of the wells in the production field, the operator estimated that he has more than 4 hours until the fluid reaches a critical level. Production in normal conditions is estimated to 1.5 m^3/h.
- The field operator arrives at the Pft-6 site within one and a half hour of the call and finds the overfilled T-67

Incident Consequences and potential outcomes

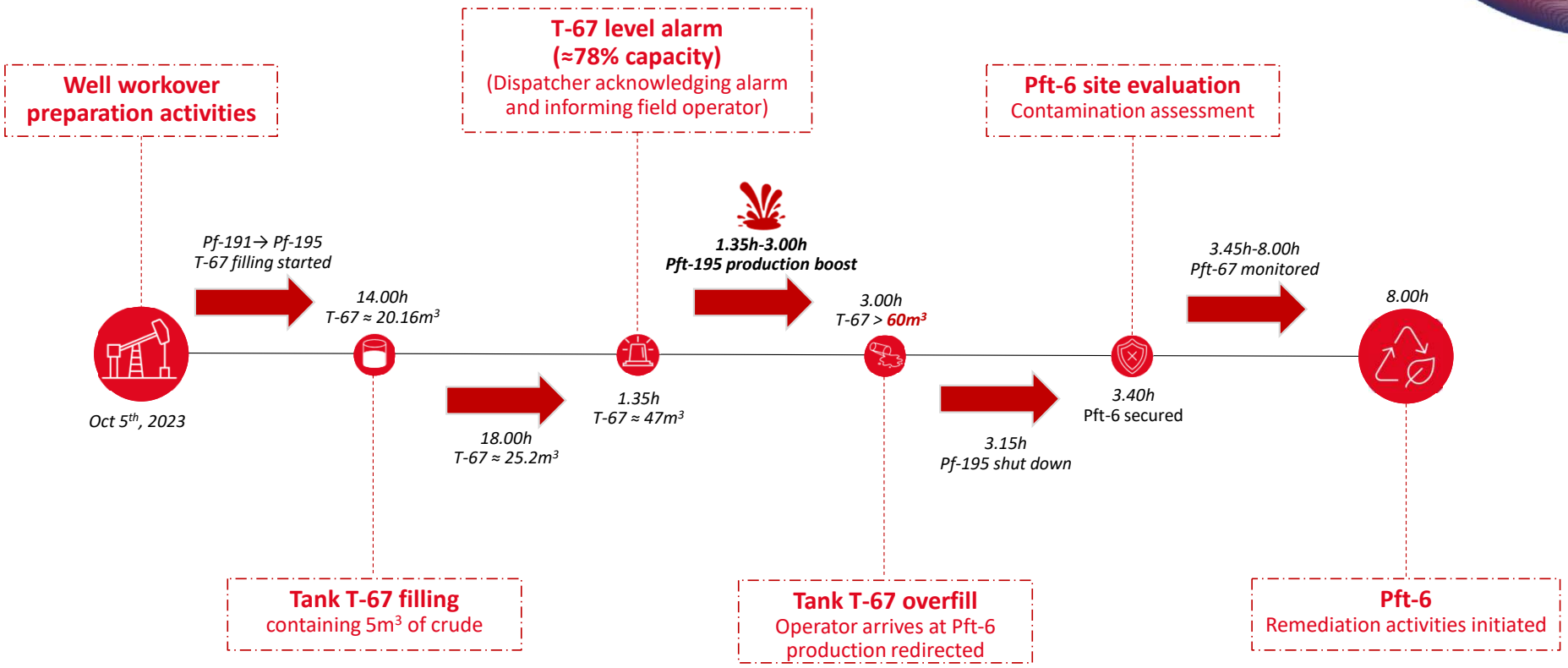
Immediate consequences:

- $5m^3$ of formation water and $5m^3$ of crude oil spilled out of the tank's breather
- The spilled product contaminated the tank, piping, fittings and the ground inside the bund
- 116 tones contaminated soil to be remediated
- Asset damage and remediation damages up to $100k,

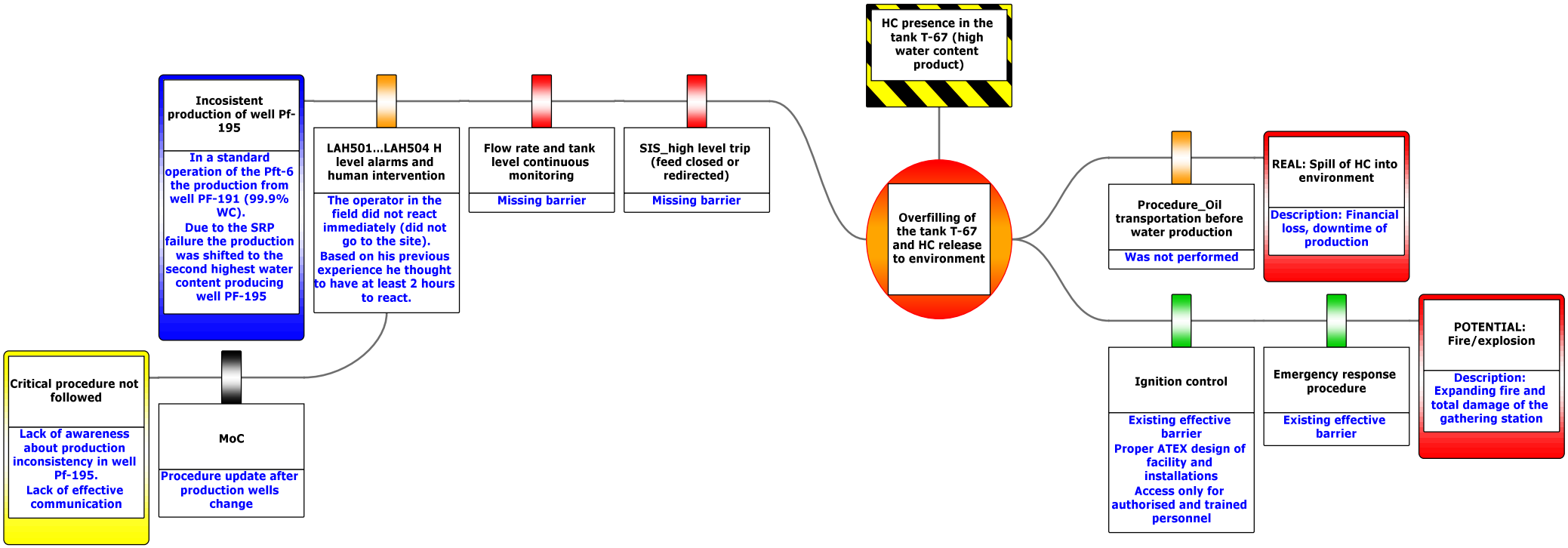
Potential consequences:

- Only the calm and conscious decision by the Operator not to close the well but rather diverted the production avoided unforeseen consequences such as fluid kick and increase in the pressure of the flowline
- Fire/explosion of the leaked crude with high expansion condition and full Pft-6 destruction potential

Incident timeline



Incident Bow tie



PSF relevance

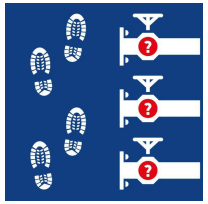
WHY?

Do not make a change without a proper MoC process

- Introduction of unforeseen risks due to the change
- Unknown adverse effect of the change on the equipment

Operate within safe limits

- Production properties not communicated
- Uncontrolled production boost, process upset



Walk the line (to ensure operational readiness via pipeline and valve line-ups)

- Set-up change of feed and regular flow
- No effective and automated barriers

Lessons learned and actions for improvement

- Perform Management of Change procedure to assess the operational risk increased during years of oil and gas exploitation (produced material composition change such as water-cut increase)
- Select critical process parameters at all gathering stations and implement proper monitoring system (with H/HH alarms and actions defined in case of H/HH levels exceeding)
- Establish frequent formal communication with the Reservoir Engineering about the status of the HC wells:
  - Flow rate (IPR/VLP)
  - Temperature
  - Pressure
- PF-195 Sucker Rod pump oil well can only be produced to storage tank under constant supervision of the operator
- Mass flow meter will be installed on the S-3 measuring separator, therefore the wells will be measurable directly via the main gathering pipeline during normal production
- Perform operational risk assessment during washing-out activity

Thank you for your attention!