



# REDUCE COKE DRUM VENT PRESSURE

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**Coking.com**



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# AGENDA

1. New rules to manage coke drum venting
2. Operational and technical considerations
3. Options – process flow diagram format

Not intended to provide specific guidance or legal interpretation of existing or anticipated government rules.



# NEW RULES TO MANAGE COKE DRUM VENTING

## Government rules

1. Anticipated new US EPA rule
  - Proposed rule expected by mid-May 2014
2. South Coast AQMD rule (Southern California)
  - Rule 1114 adopted 3-May-2013
3. Site specific permits
  - Several site specific rules



# NEW RULES TO MANAGE COKE DRUM VENTING

## Requirements

### 1. New US EPA Rule (content not yet made public)

- Threshold pressure before venting (anticipated in rule)
- Threshold temperature (possibly in rule as an alternative)
- Averaging?

### 2. SCAQMD rule 1114

“... depressurize each coke drum to less than 2 psig prior to venting it to atmosphere”

### 3. Site specific permits have also included:

- Makeup quench water quality limits
- Not allowed sludge coking
- Minimum total quench water volume
- Minimum quench time or add a soak period



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# OPTIONS TO REDUCE VENT PRESSURE

If unable to achieve the target pressure with existing system, then must add a means to lower pressure.

Implemented or considered:

1. Connect to flare gas recovery compressor
2. Add off-gas compressor on the blowdown settling drum
3. Add ejector on the blowdown settling drum
4. Add ejector on the coke drums
5. Water fill and overflow drums



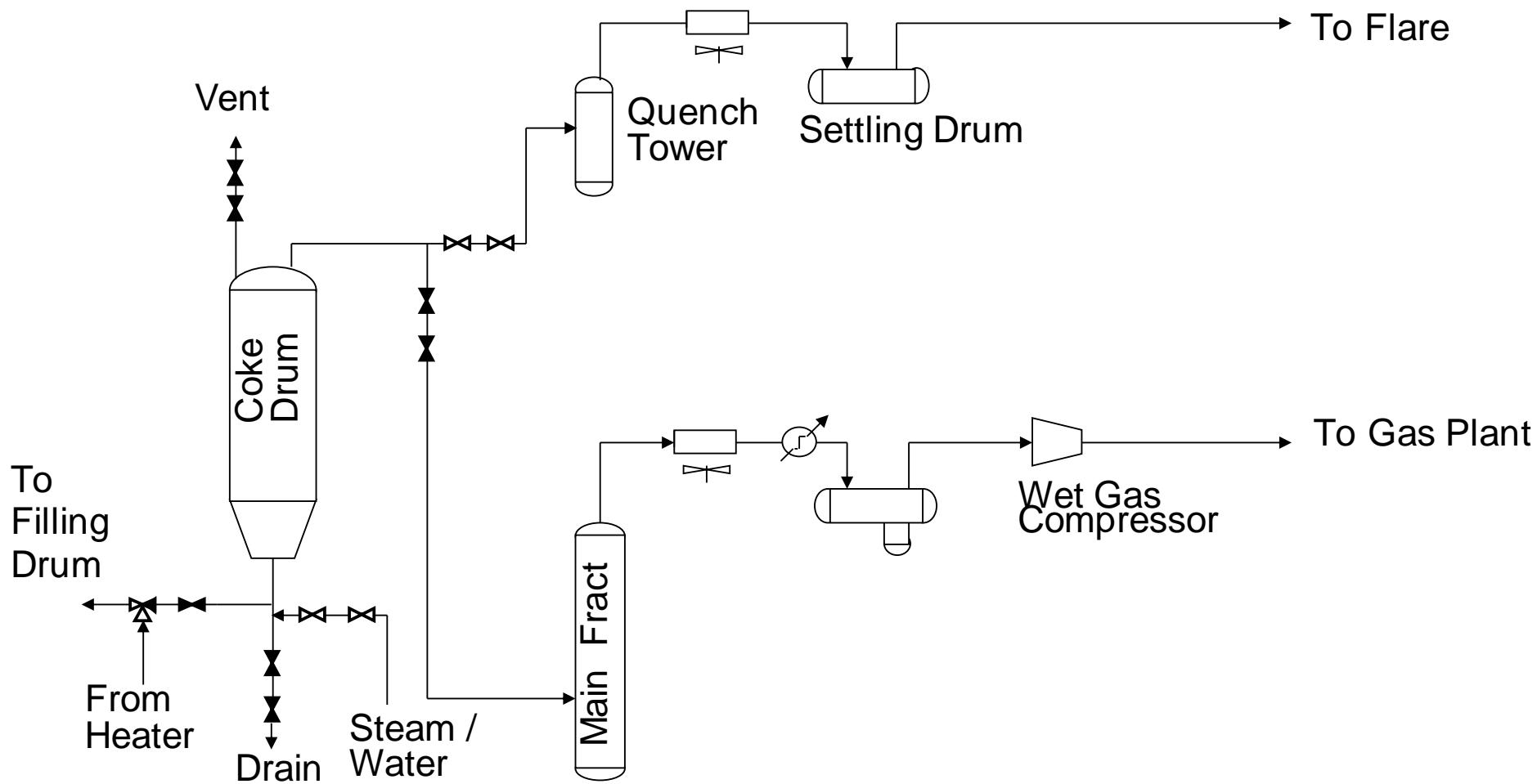
# OPERATIONAL AND TECHNICAL CONSIDERATIONS

## No two cokers alike – different solutions

1. Drum cycle time – throughput impact
2. Operating pressures
3. System pressure drop - prior to venting
  - Piping, valves, air coolers
4. Blowdown air cooler capacity
5. Main fract OH cooling, compression, & sour water handling
6. Ejectors
  - Motive steam must be condensed and processed
7. Compressors
  - expensive to install and maintain.
8. Flare gas recovery system location and capacity
  - Piping and other equipment pressure drop

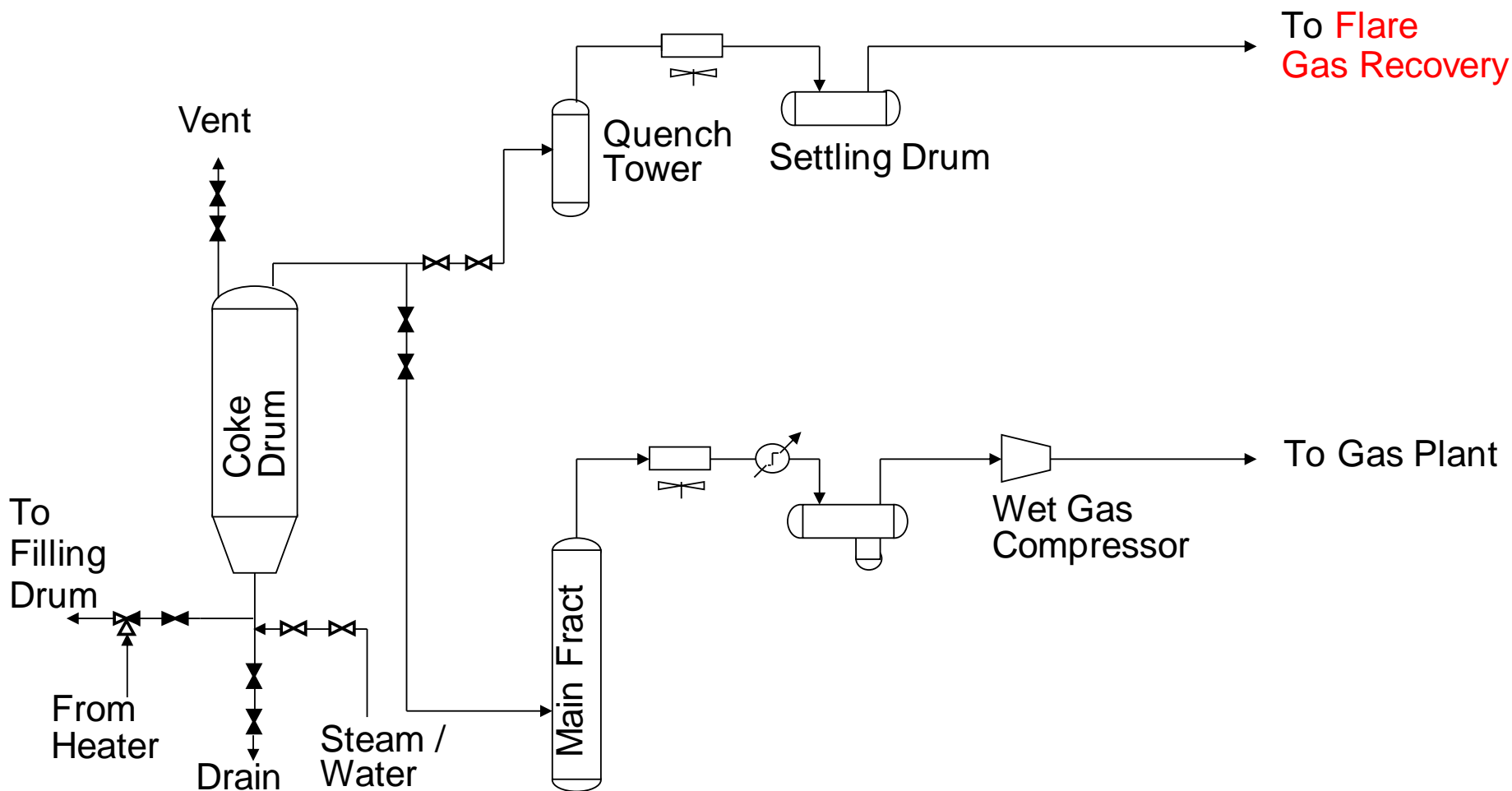
# Base: Original Closed Blowdown System connects to flare

- Coke drum pressure set by system hydraulics and flare system back pressure



# Option 1: CBS off-gas to flare gas recovery system

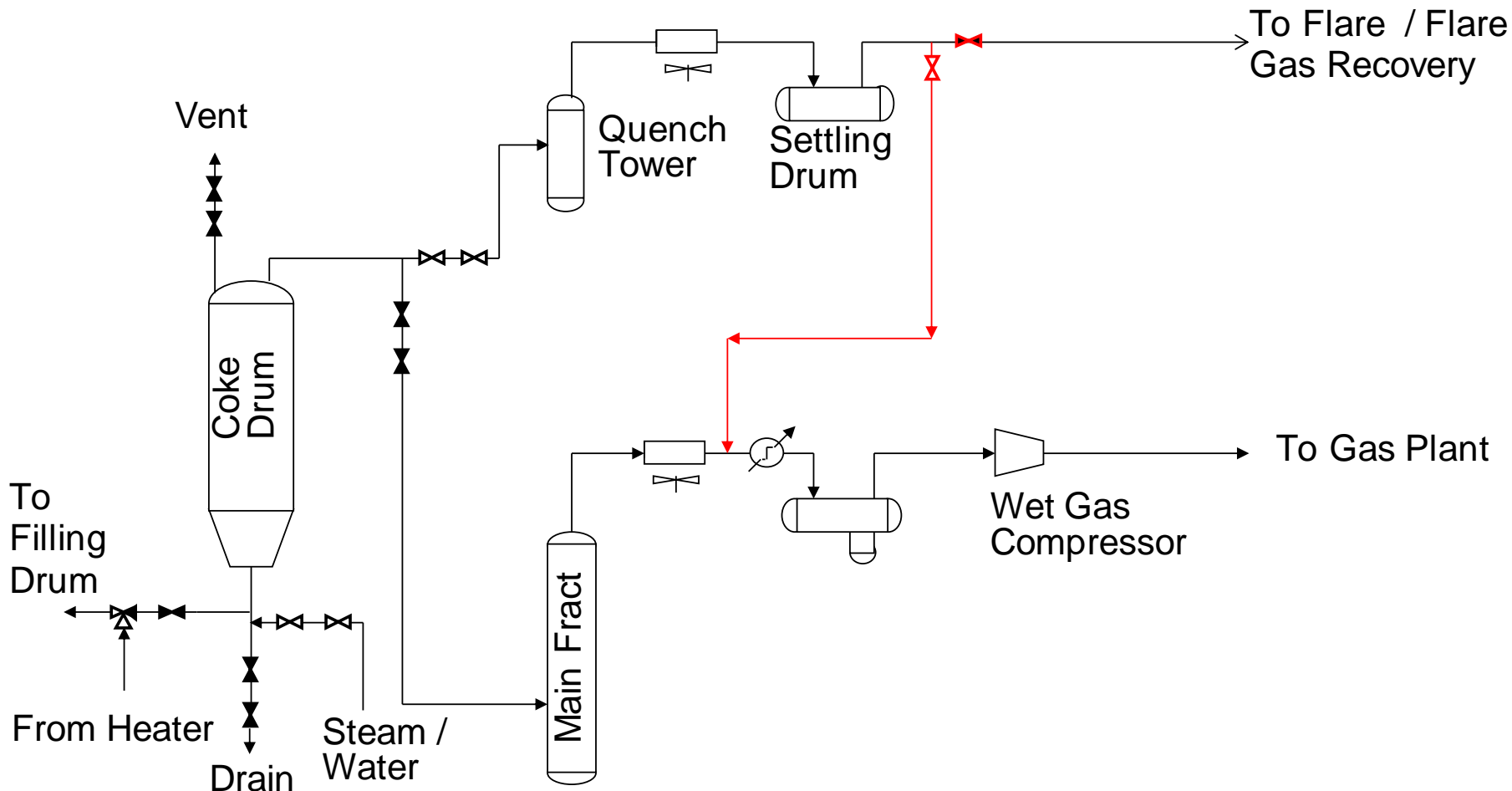
- Avoids direct connection to flare
- Coke drum pressure set by system hydraulics & flare gas recovery compressor suction





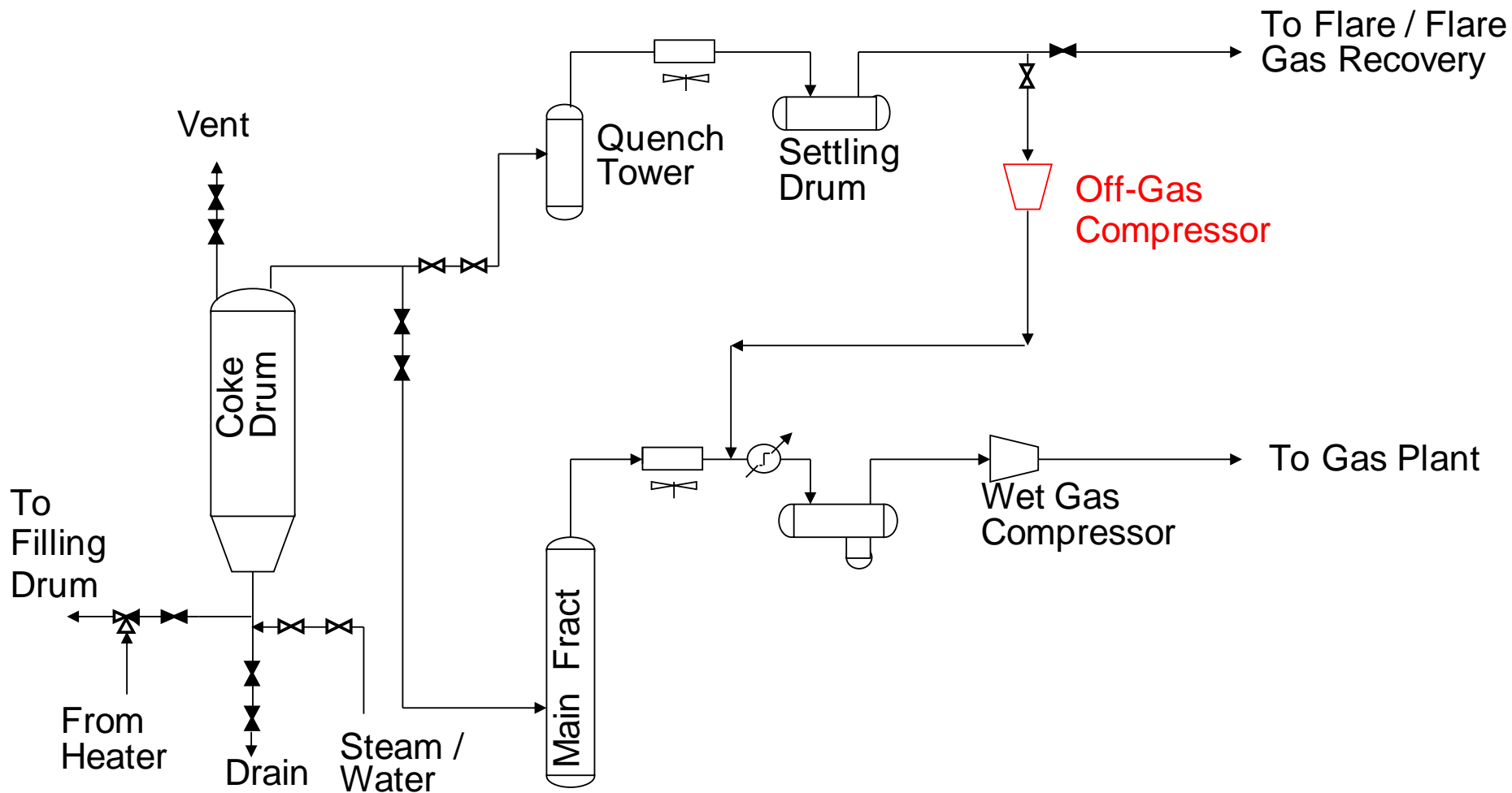
## Option 2: CBS off-gas to main fractionator overhead

- Avoids direct connection to flare with no additional equipment
- CBS has to operate at higher pressure
- Coke drum pressure set by system hydraulics and main fractionator overhead pressure.



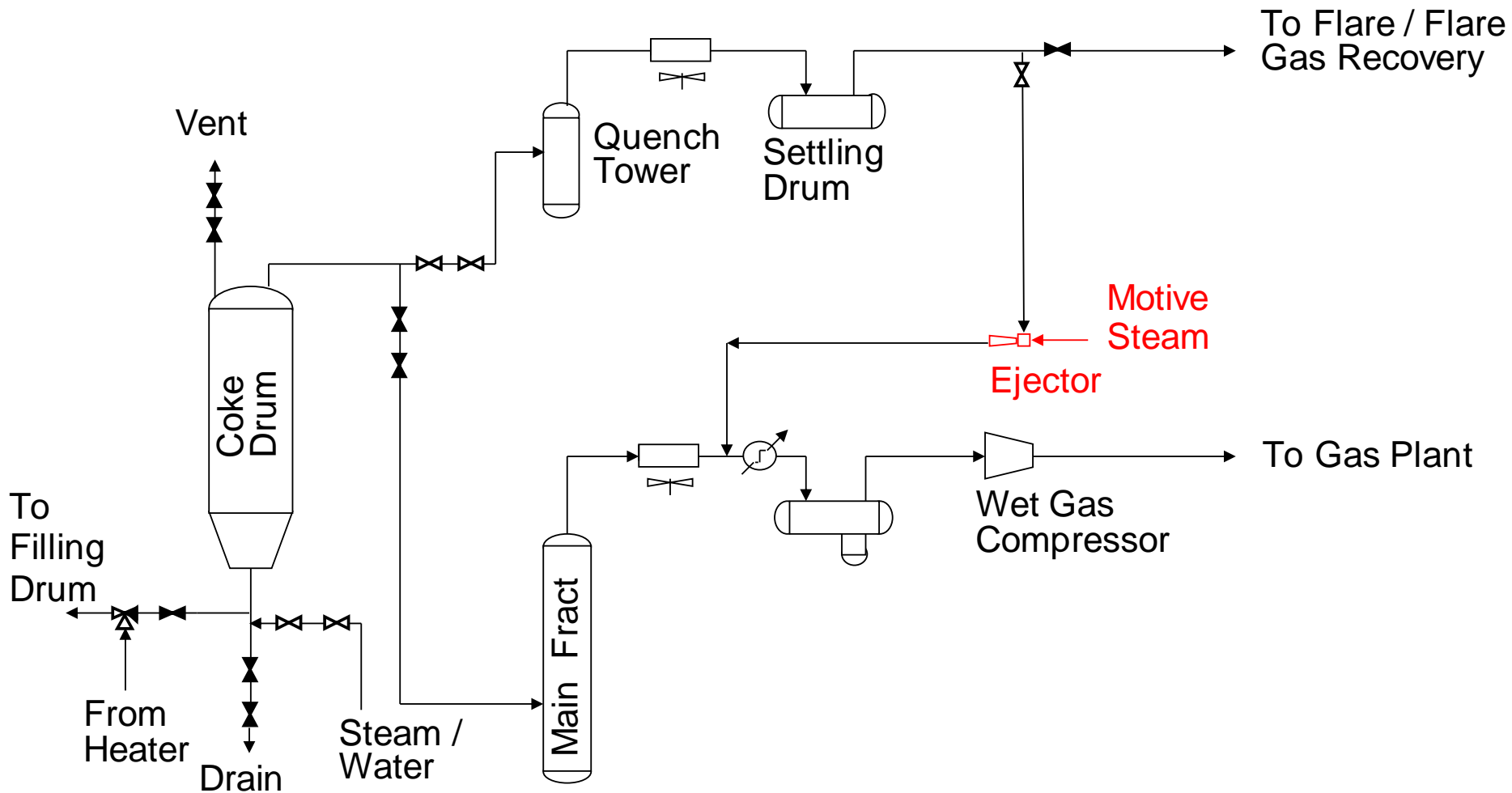
# Option 3: CBS off-gas compressor to MF overhead system

- Avoids direct connection to flare
- Coke drum pressure set by system hydraulics and off gas compressor suction pressure.



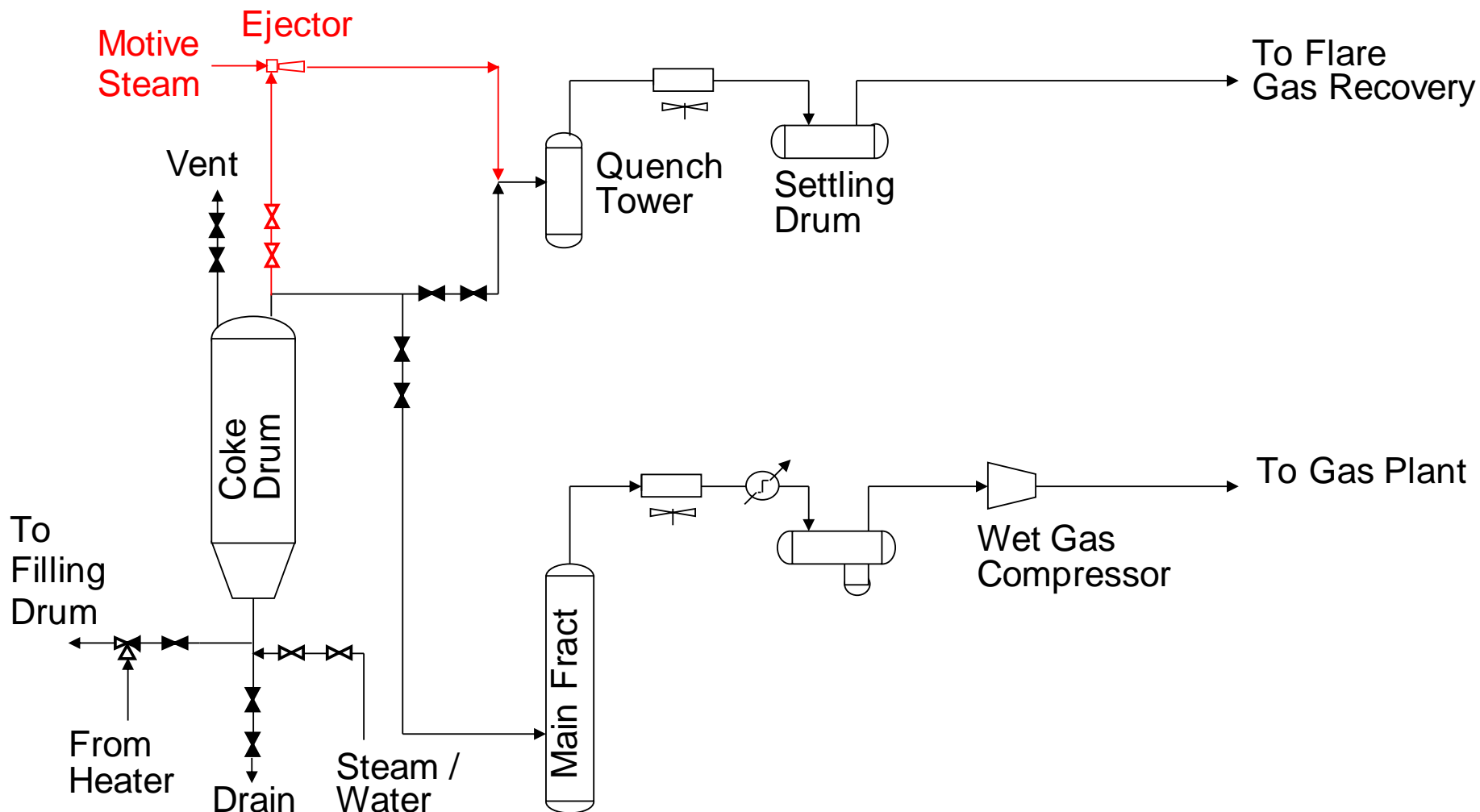
## Option 4: Steam Ejector to MF overhead system

- Avoids direct connection to flare
- Coke drum pressure set by system hydraulics and ejector suction pressure.



# Option 5: Ejector on Coke Drum

- Coke drum pressure set by ejector design.



# Option 6: Overflow Coke Drum with Quench Water

- Intention to meet temperature limit

