तेल उद्योग सुरक्षा निदेशालय
Oil Industry Safety Directorate
ISO 9001:2015 certified

सुरक्षा संवाद
Suraksha Samwad

An opportunity to learn from mistakes....

Disclaimer

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17 year + in upstream and downstream process.
BE – Fire from NFSC Nagpur, Certified safety professional and certified function safety professional.
Position – Lead process safety management in HMEL,
Previous experience in Cairn India ltd, RIL and Petronet LNG ltd.

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Boil Over Incident at Bitumen Loading Gantry

Process safety Tier – 1 incident

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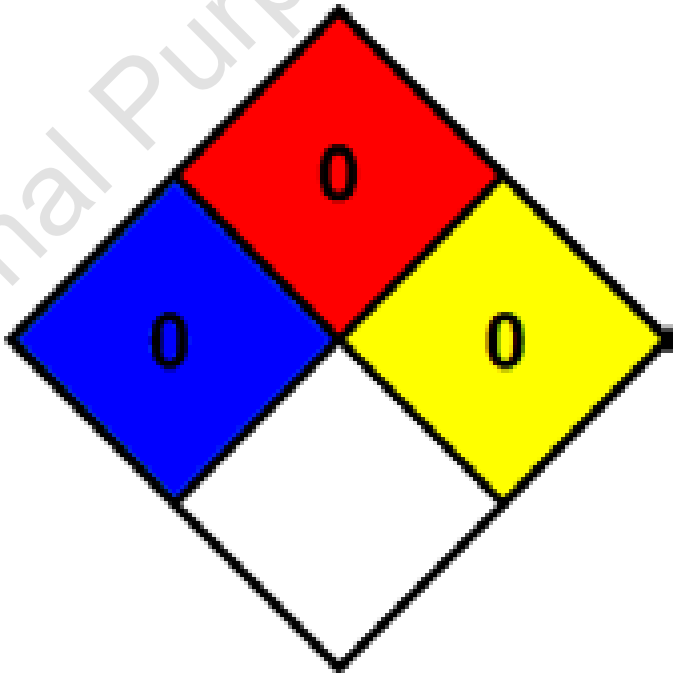
Water



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Water

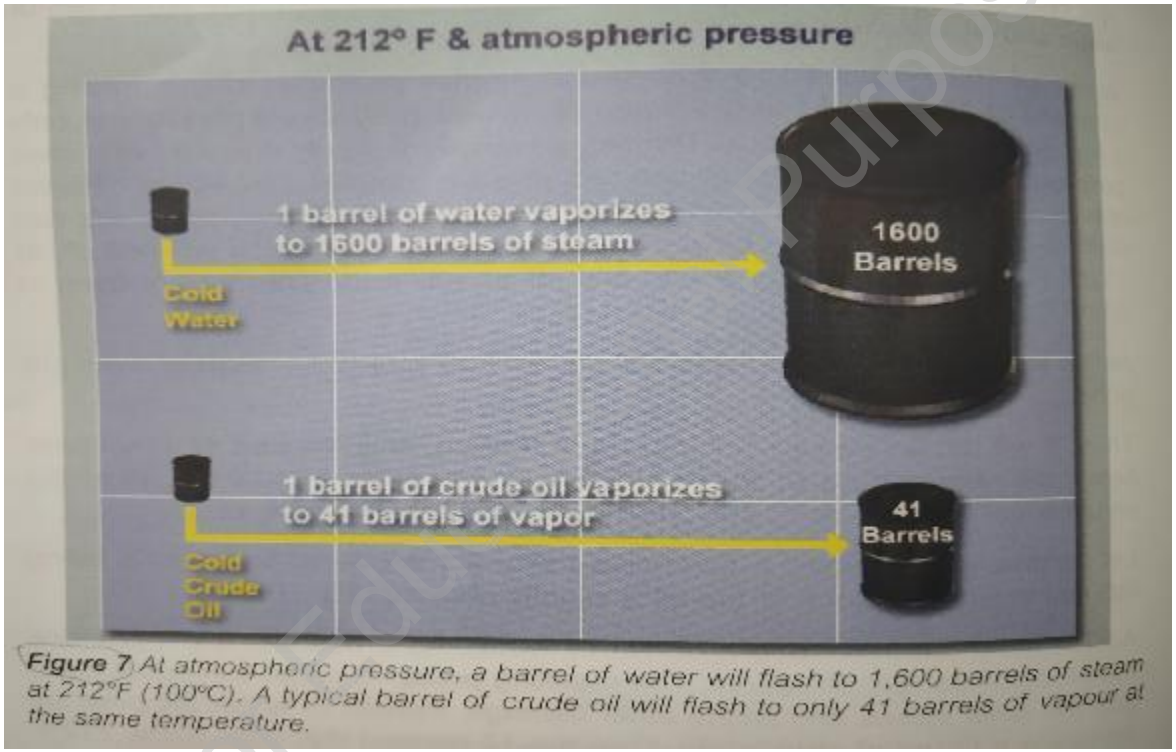

Figure 7 At atmospheric pressure, a barrel of water will flash to 1,600 barrels of steam at 212°F (100°C). A typical barrel of crude oil will flash to only 41 barrels of vapour at the same temperature.

Water to Steam

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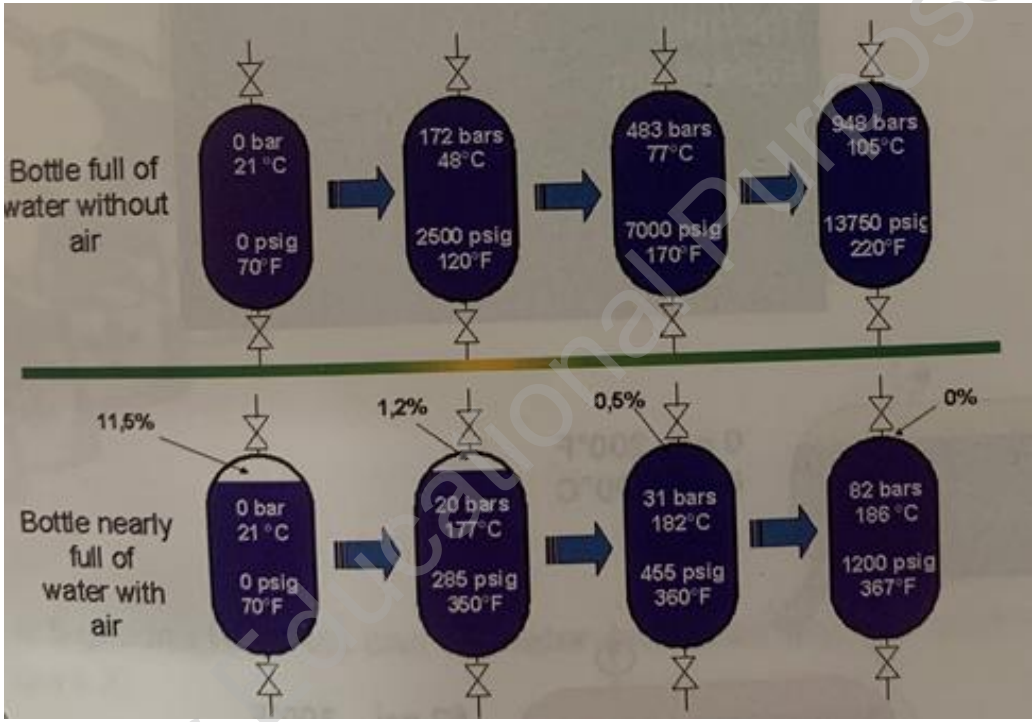
Water



Water in vessel with and without vapour space.

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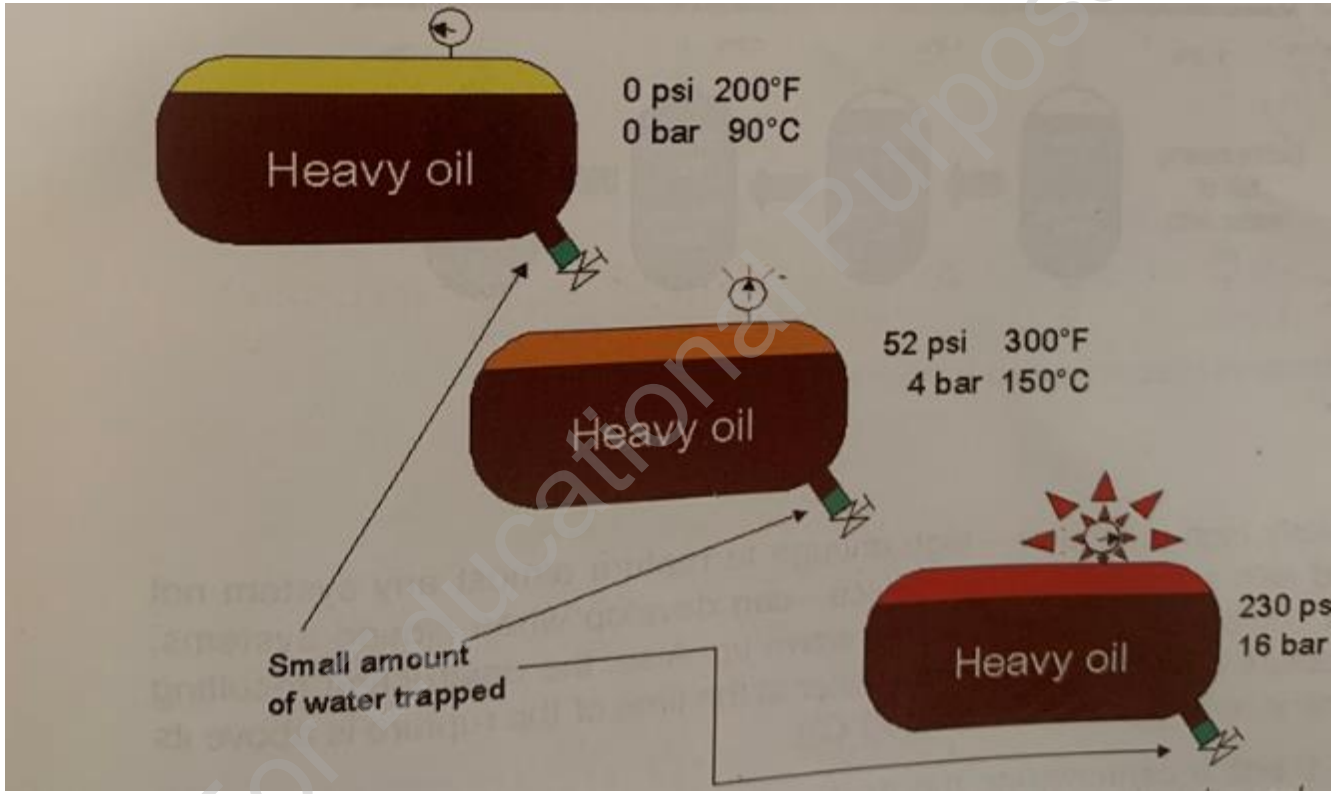
Water



Water heated in closed vessel.

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BRIEF DESCRIPTION OF INCIDENT

Tanker Truck (TT) was under loading at bay no 08 of Bitumen road gantry. When approx. 22T product was loaded in TT against pre-set of 32T, Operator noticed unusual bubble formation inside the tanker. Suddenly hot bitumen (150-160'c) came with pressure through the manhole and this continues approximately 2 min. The Product stream from manhole was touching the roof of TT gantry (approx. 8mit height). The loading operation stopped immediately and injured person shifted to OHC for treatment.

While evacuating the area, Loading Operator, Driver & TT Helper exposed with bitumen.

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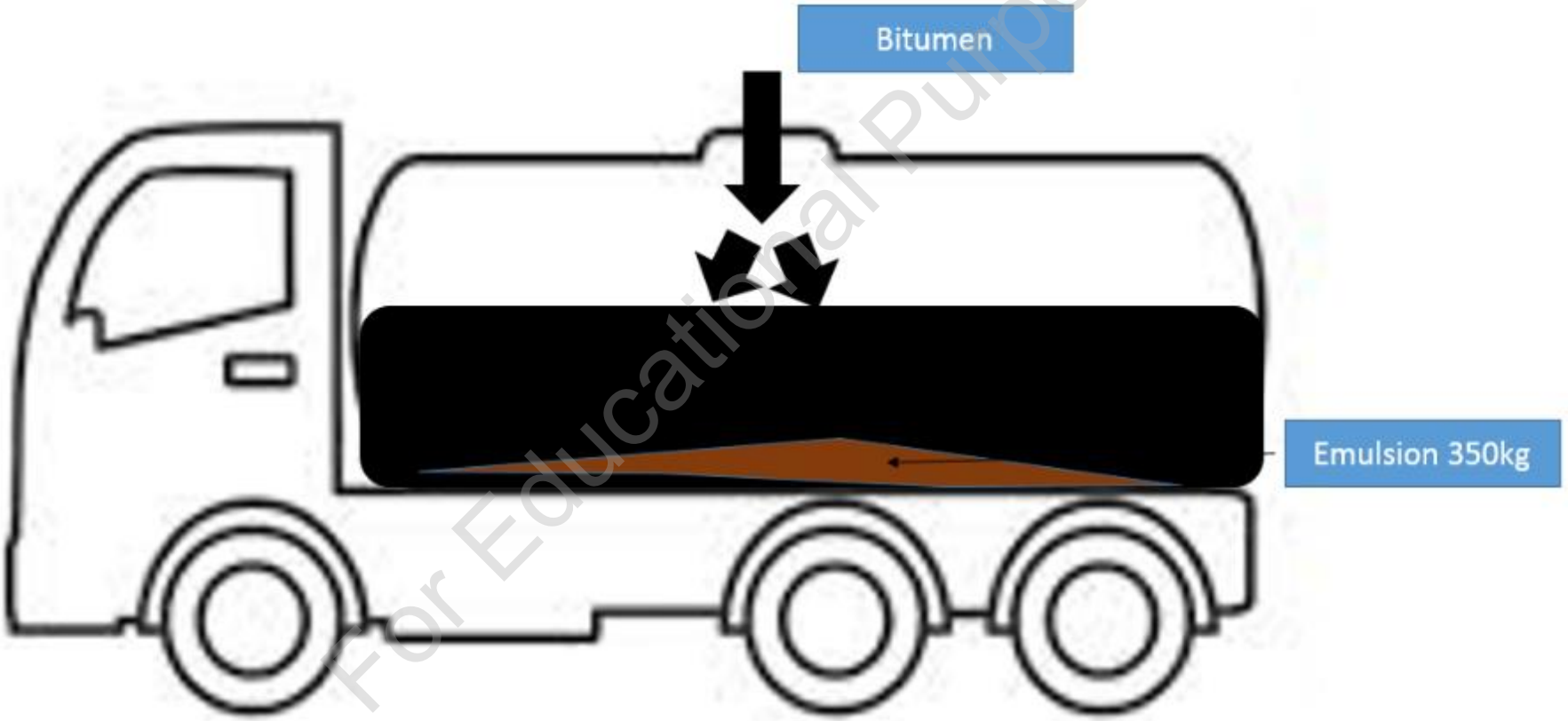
What went wrong – Immediate cause



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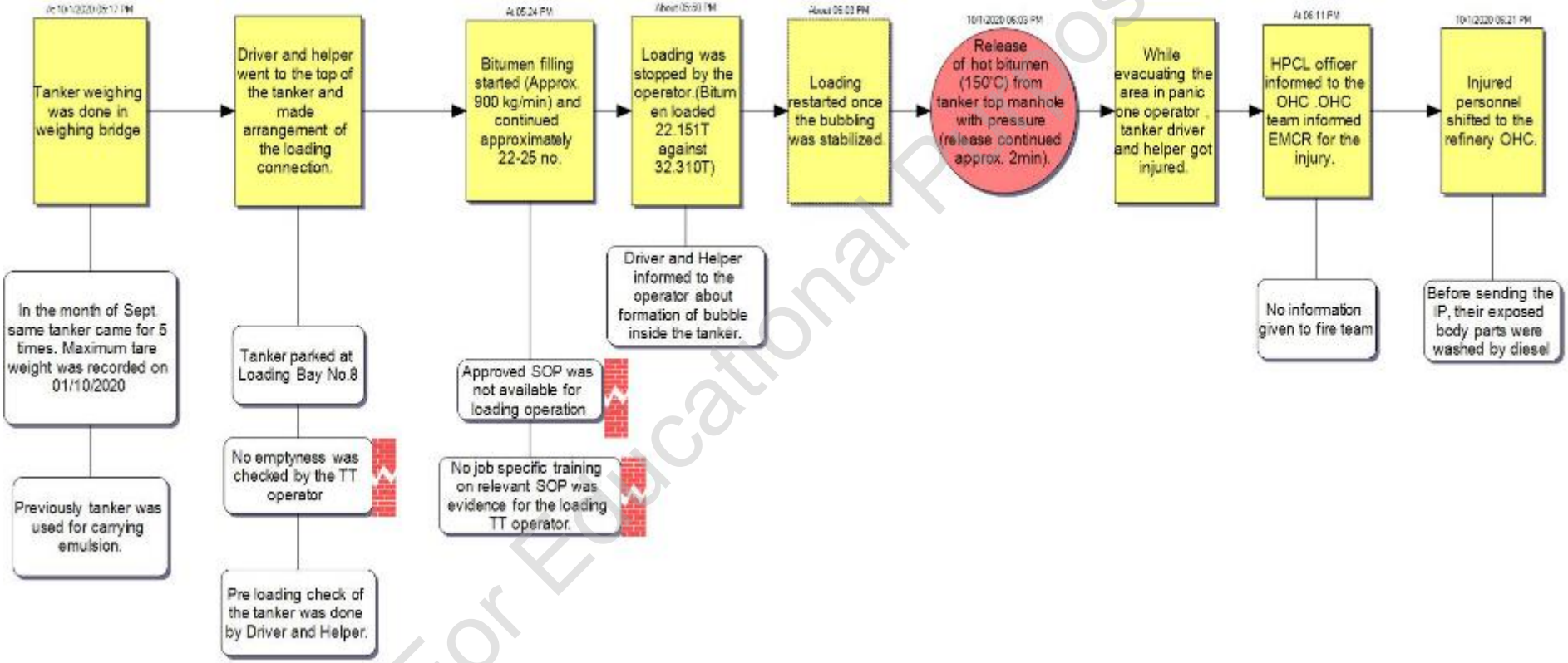
Sequence of Event and Failed barrier



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Failed Barrier

- Tanker used for transporting emulsion
- Emptiness of tanker not checked.- Checklist available but not followed.
- Normalisation of deviance. – Previous low severe incident not reported and investigated.
- Low sense of vulnerability. – Probable hazard is only hot material.

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Learning

- Tanker used for transporting emulsion must not be use to load bitumen.
- Must follow Checklist / operating procedure.
- Consider hazard of water during HIRA.
- NoD and SoV.

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Sense of Vulnerability

Why Bubbling in tanker happen when I am loading Bitumen?

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Normalisation of Deviance (NoD)

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Bubbling in tanker will happen every time when I fill the tanker.

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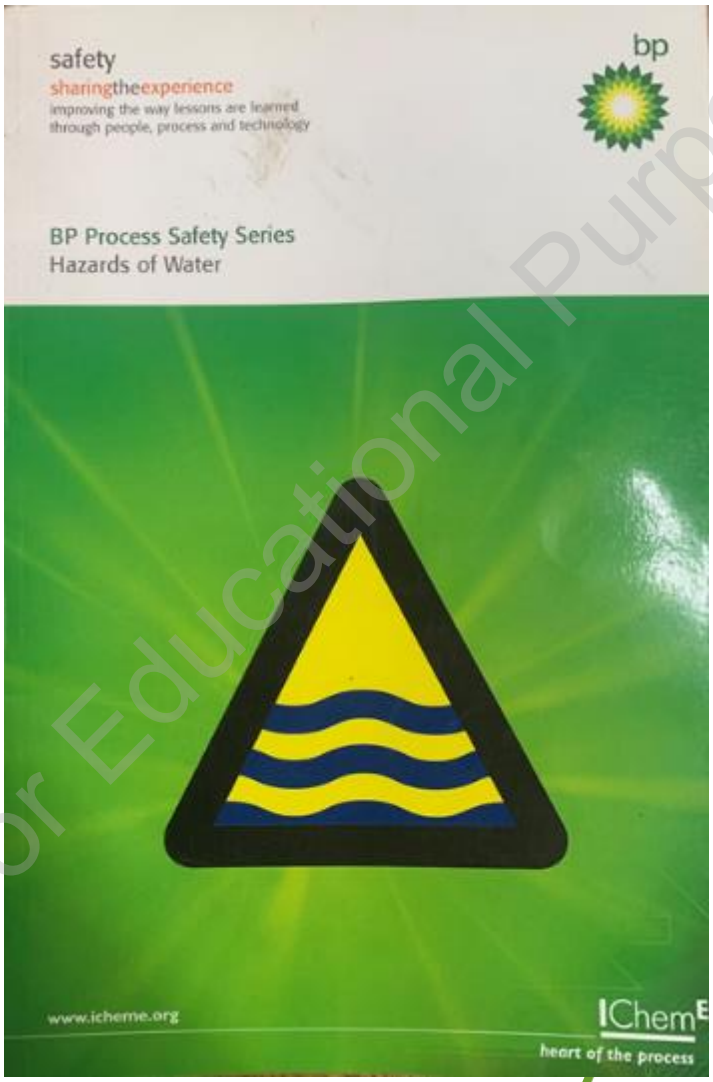
Water Hazard



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Thank You

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