

# Case study for onboard safety meeting

## Case study no. 35: Sampling

Please read the below story of an incident. Keep our company's standards and procedures in mind while reading to compare with the actions of the crew below as we will discuss the factors which led to the incident occurring.

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A chemical tanker was enroute from Port A to Port B in order to load cargoes of MTBE, Methanol, Phenol, MEG and PG USP. All tanks to be loaded in Port B were inspected in Port A and the vessel was found suitable to receive the intended cargoes.

At the chemical berth in Port B, the shore cargo hoses were connected to the vessel's manifolds. The connection points had been checked and found to be in order. All the cargoes had designated shore lines. As the stay at the terminal was quite busy, it had been decided that it was necessary to double the number of crew present during the initial start-up phase. Present at the manifold were the duty ABs, the duty officer and the pump man, all wearing the proper protective equipment for manifold sampling.

Manifold samples were taken from all the cargoes to be loaded. For this specific loading the shippers decided that four of the cargoes would need the manifold samples analysed before cargo could be loaded into the tanks. These cargoes were Methanol, Phenol, MEG and PG USP. The reason for picking these cargoes was the sensitive nature of the product and experience of previous quality issues at this terminal.

For the fifth manifold sample (MTBE), only a visual inspection was required to ensure that the cargo was in apparent good order and condition prior to opening the manifold valve and before loading into the tanks. The four cargoes requiring analysis were sampled first. The first sample drawn was from Methanol, followed by MEG and PG USP, and the final manifold sample was from Phenol. Before drawing the third sample from the PG USP, the AB cleaned the sampling cock and considered Methanol to be an appropriate cleaning medium for this purpose. He then cleaned the sampling cock again before drawing the fourth sample from Phenol. The samples were taken to the laboratory for analysis. The estimated time needed to analyse the samples was four hours.

Once the manifold samples had been approved, loading would continue and first foot samples would then be drawn from the tanks. These samples were only visually inspected for apparent good order and condition. From the manifold; the Methanol sample was seen to be visually ok. The Phenol sample was hazy and therefore not ok and slopping was required because the cargo coming from the shore line was not in apparent good order and condition. This could have been due to residues from previous cargo operations on the shoreside. After the slopping of 5 drums, the sample was found to be in apparent good order and condition and sent to the lab for analysis. MEG and PG USP samples were found to be in apparent good order and condition and no slopping was required.

All manifold samples requiring analysis were sent to the laboratory for testing. The analysis results showed that the Methanol and Phenol sample passed and loading could therefore continue. The MEG and PG USP samples failed and it was necessary to resample. In the second sampling round the drain cock was again cleaned with methanol. Once the resampling was completed, both of the samples were taken to the laboratory, and after another four hours both samples failed again. It was now identified that the samples failed due to the presence of methanol. How could this be possible?

The cargo surveyor returned to the vessel and collected the new samples. However this time the sampling cock was cleaned with methanol and then steamed before drawing the samples – and the samples passed the analysis. It took more than 12 hours from drawing the first sample until all samples had passed and vessel could start loading.

# How to improve by lessons learnt

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Based on the case and the keywords, you should now perform an onboard risk assessment of the operation described. Bear in mind our vessel's procedures.

You can also discuss the questions below in order to determine onboard areas/topics for increased awareness:

1. How can you ensure that a correct sample is taken?
2. How can you ensure that the sample equipment is suitable and correctly cleaned before use?
3. Do we have an understanding of the consequences of taking a wrong sample?
4. If cargo surveyor takes an incorrect sample, what can you do to make sure he will take a correct sample?
5. What are the consequences of the surveyor taking a wrong sample?
6. Sample labelling; why is this so important and why does it need to be logged correctly?
7. Is the correct PPE (personal protective equipment) available for the sampling we are about to do?
8. Is the correct type sample bottle available?
9. Surveyor says the sample is ok, but you have some doubt - what do you do?
10. Do you understand the financial impact it will have on the company if proper sampling procedures are not followed and samples fail and needs to be retaken?
11. Do you understand how important the samples are as evidence in order to support any claim that can be filed against your vessel?
12. Do you understand why you should never empty the first sample from shore? Even if it is contaminated do you understand why that "million dollar" sample is so important to the company?

## 1 What factors contributed to the incident in the above case?

## 2 Risk Assessment: Could some of the factors identified be present on board your ship? (How frequent could they be present? How severe could it be if they are present?)

## 3 In the risk transfer zone (yellow and red), what would you suggest as measures to control the risk? Any additional barriers that could be introduced?