

*“Comply? For 40 years we classified crude
by API Gravity!!!”*: DOT/PHMSA 49 CFR
§173.41

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Outline of Presentation



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- Introduction
- Rule - 49 CFR §173.41
- Modes of transport affected by Rule
- Interpretation – Refined vs Unrefined
- Steps for compliance
- Example – Elements of a SAP
- Summary



- 49 CFR §173.41 – Modes of Transport
- Sampling and testing program for unrefined petroleum-based products
- Classification of Crude Oil offered in Transportation (Class 3 Flammable Liquids)
- Characterization of Crude Oil

Rule - 49 CFR §173.41



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“§173.41 Sampling and testing program for unrefined petroleum-based products.

(a) *General.* Unrefined petroleum-based products offered for transportation must be **properly classed and described as prescribed in §173.22**, in accordance with a sampling and testing program, which specifies at a minimum:

- (1) **A frequency of sampling and testing** that accounts for any appreciable variability of the material (e.g., history, temperature, method of extraction [including chemical use], location of extraction, time of year, length of time between shipments);
- (2) **Sampling prior to the initial offering** of the material for transportation and when changes that may affect the properties of the material occur (*i.e.*, mixing of the material from multiple sources, or further processing and then subsequent transportation);
- (3) **Sampling methods** that ensure a representative sample of the entire mixture, as offered, is collected;

Rule - 49 CFR §173.41



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- (4) Testing methods that enable classification of the material under the HMR;
 - (5) **Quality control measures for sample frequencies;**
 - (6) **Duplicate sampling methods or equivalent measures for quality assurance;**
 - (7) **Criteria for modifying the sampling and testing program;** and
 - (8) Testing or other **appropriate methods** used to identify properties of the mixture relevant to packaging requirements (e.g., compatibility with packaging, identifying specific gravity for filling packages).
- (b) *Certification.* Each person who offers a hazardous material for transportation shall certify, as prescribed by §172.204 of this subchapter, that the material is offered for transportation in accordance with this subchapter, including the requirements prescribed by paragraph (a) of this section.

Rule - 49 CFR 173.41



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(c) *Documentation, retention, review, and dissemination of program.* **The sampling and testing program must be documented in writing (i.e. hardcopy or electronic file thereof) and must be retained for as long as the sampling and testing program remains in effect, or a minimum of one year.** The sampling and testing program must be **reviewed at least annually and revised and/or updated as necessary to reflect changed circumstances.** The **most recent version of the sampling and testing program must be available to the employees who are responsible for implementing it.** When the sampling and testing program is updated or revised, all employees responsible for implementing it must be notified, and the most recent version must be made available.

(d) *Access by DOT to program documentation.* Each person required to develop and implement a sampling and testing program must maintain a copy of the sampling and testing program documentation (or an electronic file thereof) **that is accessible at, or through, its principal place of business, and must make the documentation available upon request at a reasonable time and location to an authorized official of the Department of Transportation.**

[80 FR 26746, May 8, 2015]”

Modes of Transport under § 173.41



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- All modes except pipelines (traditional)
- Federal Register publication Reference **(80 FR 26746, May 8, 2015)**
- Plain reading of 49 CFR § 173.41



Modes of Transport under § 173.41



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“More Accurate Classification of Unrefined Petroleum-Based ProductsOfferors/Shippers of unrefined petroleum- based products.

Develop and carry out sampling and testing program for all unrefined petroleum-based products, such as crude oil, to address:

- (1) Frequency of sampling and testing that accounts for any appreciable variability of the material.
 - (2) Sampling prior to the initial offering of the material for transportation and when changes that may affect the properties of the material occur;
 - (3) Sampling methods that ensures a representative sample of the entire mixture, as offered, is collected;
 - (4) Testing methods that enable classification of the material under the HMR;
 - (5) Quality control measures for sample frequencies;
 - (6) Duplicate samples or equivalent measures for quality assurance;
 - (7) Criteria for modifying the sampling and testing program;
 - (8) Testing or other appropriate methods used to identify properties of the mixture relevant to packaging requirements.
- Certify that program is in place, document the testing and sampling program outcomes, and make information available to DOT personnel upon request”

Reference: 26646 Federal Register / Vol. 80, No. 89 / Friday, May 8, 2015 / Rules and Regulations

Sampling and Testing Program Overview

- Under new § 173.41 shippers in **all modes** must develop and carry out a sampling and testing program for all unrefined petroleum-based products.
- In addition, shippers must certify that program is in place and make information available to DOT personnel upon request.
- Voluntary use of API RP 3000 may satisfy certain requirements of the new program. However, the API RP 3000 is NOT included as IBR material at this time.

Reference: Crude by Rail Safety, NAVIGATING NEW RULES & BYPASSING MISPERCEPTIONS, FEBRUARY 1, 2016, 1:30-4:30 PM PRAIRIE ROSE ROOMS - BISMARCK CIVIC CENTER 315 SOUTH 5TH STREET, BISMARCK, ND.



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

10/15/2015

To Protect People and the Environment From the Risks of
Hazardous Materials Transportation

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Interpretation – Refined vs Unrefined



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- “Unrefined petroleum-based products” would be any material that is petroleum based, and has not undergone refinement.
- For condensates - the specific processing and treatment of material prior to transportation is necessary for determination of refinement
- Heat treating to reduce vapor pressure or to remove the dissolved gasses in crude oil so that it may be transported for refinement would not meet the AFPM or other industry definitions of refining.
- AFPM states that the heating and separation of hot gasses through a distillation column as a refinement process.” (DOC BIS – 15 CFR 754.2 (a) - condensates)
- Once a crude oil goes through a distillation tower it is considered as a Petroleum Product

Reference: PHMSA Interpretation #15-0147 – letter to Argus

Steps for Compliance



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1. SAP or S&T plan written and available for inspection
2. Classification of Crude Oil – IBP & FP
3. Characterization of Crude Oil – Initial and Ongoing
4. Determine changes in characteristics by analyzing a statistical deviation over time
5. Appropriately adjust the frequency of sampling and testing
6. Initial determination of parameters to be monitored for characterization
7. Make changes to sampling and testing based on the changes above
8. Duplicate samples for QC
9. MOC
10. Certification

Example – Elements of a SAP



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- Scope
- References
- **Safety**
- Sampling Points
- Frequency of sampling/variations in sample stream (initial and ongoing sampling)
- Quality Control
- Selection of Sampling method (criteria utilized for the sampling method selection)
- Sample Containers
- Sample Transportation
- Analytical – Parameters to be monitored for Characterization & Classification
- Analytical methods for material characterization - changes in properties of crude
- Certification of Sampling and analysis program
- Information for DOT inspections
- Data Reporting, Storage and Archival
- Training documents for field sampling
- Management of Change (MOC) to the plan and documentation.

- 49 CFR §173.41 applies to **all modes** of transport of unrefined petroleum-based products
- Sampling and Analysis plans must be established as outlined in 49 CFR §173.41
- Classification parameters – IBP & FP
- Characterization – Initial and Ongoing
- **NO ONE CANNOT CLASSIFY CRUDE by API Gravity !!!**



References



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1. Classifying and Loading of Crude Oil into Rail Tank Cars, ANSI/API Recommended Practice 3000, First Edition, September 2014.
2. 26706 Federal Register / Vol. 80, No. 89 / Friday, May 8, 2015 / Rules and Regulations.
3. <http://www.phmsa.dot.gov/portal/site/PHMSA/menuitem.6f23687cf7b00b0f22e4c6962d9c8789/?vgnextoid=bba9667abc340510VgnVCM100000d2c97898RCRD&vgnnextchannel=aa8cd3c1af814110VgnVCM1000009ed07898RCRD&vgnnextfmt=print>
4. <https://www.gpo.gov/fdsys/pkg/FR-2015-05-08/pdf/2015-10670.pdf>
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6. Crude Oil testing requirements, Kip Wills, PHMSA, *ibid* reference 7, 10/15/2015.
7. Crude by Rail Safety, *NAVIGATING NEW RULES & BYPASSING MISPERCEPTIONS*, FEBRUARY 1, 2016, 1:30-4:30 PM PRAIRIE ROSE ROOMS - BISMARCK CIVIC CENTER 315 SOUTH 5TH STREET, BISMARCK, ND.

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