

Lesson Plan

Course: Instruction Seminar

Date: 11/30/21 Total Time: 30 Minutes Instructor: XXXXX

Lesson Directions:

- Needed equipment and/or demonstration material (models, props, calculators, etc.)

Calculators

- Needed training materials (*easels, charts, projector, computer, media, etc.*)

Computer, with PowerPoint presentation

FMC Technologies LACT Proving video:

<https://www.youtube.com/watch?v=jbRE-KJEHCc>

Have video loaded prior to the presentation.

Start at 0:38

End at 2:50

- Needed handout(s) (*file name, description, location*)

Demonstration #1 LACT Proving Report

Demonstration #2 LACT Proving Report

Exercise LACT Proving Report_Answer Key

Email to the class the day of the presentation:

Exercise LACT Proving Report


- Instructor reading/support (*regulations, policies, manuals, handbooks, examples, etc.*)

43 CFR 3174

*Learning involves talking and doing
Teaching involves asking and listening*

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(Note: It is best to limit your typing to 1 or 2 paragraphs per cell.)

Est. Time	Visuals and Notes <i>(description of visuals used, props used, etc.)</i>	Introduction <i>Introduction (Attention Step, Motivation/WIIFM, Objective, Route, Instructor Credibility, Transition)</i>
3 Min. (Entire Intro)	Attention Step 	As an American citizen, why should you care if this piece of equipment, known as a LACT, functions properly? <u>Anticipated Responses:</u> safety, accuracy
	Hook (WIIFM) https://revenuedata.doi.gov/	According to the Office of Natural Resources Revenue (ONRR), in 2020 operators extracted 419,366,133 barrels of oil from Native American and Federal Onshore sources. This resulted in the operators paying \$2,241,495,176 of royalty revenue to the Federal Government. Thus, every American (meaning you and me) benefits from the amount of oil sold and the resulting royalties paid by operators. So, to answer the question, why should you care if this piece of equipment functions properly? As a BLM PAT, it is your job to ensure federal minerals are accurately measured. Now that you know why this lesson is important, let's take a look at the objective for today.
	Objective	Ask a student to read the objective. Given a LACT Proving Report, determine if the meter factor limits are within 43 CFR 3174.11. Now that we know what our objective is, let's go over what we will be covering today to meet that objective.


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	Route	<p>First, we will go over some LACT proving report task knowledge.</p> <p>Next, I will show you how to determine if the meter factor limits are within the required parameters.</p> <p>Then, we will do an example together.</p> <p>Finally, you will do an exercise, where you will determine the meter factor limits on your own.</p>
	Instructor Credibility	<p>Good morning. My name is XXXX. I work for the BLM as a Production Accountability Technician (PAT). I'm located in the North Dakota Field Office (NDFO) in Dickinson, ND. I've worked at the NDFO for the last 10 years, 3 years as a Minerals Assistant and 7 years as a PAT. The NDFO is the second busiest oil and gas office in the nation with many operators leading the way in new oil and gas development and technologies. During the last 10 years, I've gained a lot of knowledge and experience working at the NDFO, especially as a PAT.</p>
	Transition	<p>Now that you know what we will be covering and who I am, let's begin by defining a LACT proving.</p>

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7 Min.	<p>Topic 1: Task Knowledge</p> <p>Picture of a LACT Prover and LACT Building:</p> 	<p>A Lease Automated Custody Transfer (LACT) meter is a piece of equipment that measures the amount of oil sold.</p> <p>What is a LACT proving?</p> <p><u>Anticipated Responses:</u> A test. A way to make sure the LACT working properly.</p> <p>Answer: According to Liquid Meter Provers 2015 RMMS by Dave Seiler, a meter proving is a physical test used to determine the accuracy and performance of a liquid meter.</p> <p>What is a LACT proving report?</p> <p><u>Anticipated Responses:</u> Document, Report</p> <p>Answer: A LACT proving report is a piece of paper that documents the LACT proving results.</p> <p>Pictured here is a Bi-Directional Prover which is mounted onto the back of the truck. The LACT building is where the LACT meter is housed. The truck pulls onto location and connects to the LACT meter. To demonstrate a LACT proving, we will watch the following video created by FMC Technologies.</p> <p>Show video of LACT proving: https://www.youtube.com/watch?v=jbRE-KJEHCc Start at 0:38 End at 2:50</p>

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	<u>Prover Volume</u> <u>Meter Volume</u>	<p>What is a meter factor?</p> <p><u>Anticipated Responses:</u> A calculation. A ratio.</p> <p>Answer: 43 CFR 3174.1 defines a meter factor as a ratio obtained by dividing the measured volume of liquid that passed through the prover by the measured volume of liquid that passed through the meter. Essentially, it's the prover volume divided by the meter volume.</p>
		<p>Why is a LACT proving important?</p> <p><u>Anticipated Responses:</u> To make sure the LACT is functioning correctly. To make sure oil sales are measured accurately.</p> <p>Answer: To ensure the LACT is accurately measuring the amount of oil that passes through the meter and goes to sales.</p>
		<p>When is a LACT required to be proved?</p> <p><u>Anticipated Responses:</u> Periodically (annually, semi-annually, quarterly, etc.)</p> <p>Answer: 43 CFR 3174.11(d) states the LACT must be proved when first installed and every 3 months thereafter, unless the meter measures 75,000bbls of oil first. In general, a LACT is required to be proved every 3 months.</p>
		<p>Who is responsible for verifying LACT proving reports?</p> <p><u>Anticipated Responses:</u> BLM PATs PETs</p>

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		<p>Where are the meter factor limits defined?</p> <p><u>Anticipated Responses:</u> BLM Regulation 43 CFR 3174.11</p> <p>Answer: To verify the Unity: 43 CFR 3174.11(c)(7) states the meter factor must be at least 0.9900 (ninety-nine hundredths) and no more than 1.0100 (one and one hundredth).</p> <p>To verify the Meter Factor Deviation: 43 CFR 3174.11(e) states the difference between two successive meter factors must be within +/-0.0025 (positive/negative twenty-five ten-thousandths).</p>
		<p>Transition: Now that we have covered some task knowledge on LACT provings, let's now take a look at how to verify the meter factors from the LACT proving report.</p>

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	Delete the white box to display the MF Deviation answer.	<p>1.0014 (one and fourteen ten-thousandths) minus 1.0015 (one and fifteen ten-thousandths) equals -0.0001 (negative one ten-thousandth) Is the -0.0001 within +/-0.0025? Yes, -0.0001 is within the required parameters.</p> <p>The answer to both items is yes, so the meter factor limits are within the required parameters and the LACT is accurately measuring oil sales.</p>
10 Min.	<p>Exercise:</p> <p>Display Exercise LACT Proving Report on the screen. Let the students do this one on their own.</p>	<p>Now that we have done a couple together, you will test your new skills on your own. Verify the LACT proving report that I emailed to you this morning. Check the Unity and the Meter Factor Deviation. This is an individual exercise. You will have 5 minutes to complete the exercise. After everyone has finished, we will go over the results together. Let me know if you have any questions.</p> <p><u>Conduct Out-brief:</u> Call on a student asking, is the unity within 0.9900-1.0100? Unity: Yes, 1.0012 (one and twelve ten-thousandths) is within 0.9900-1.0100.</p> <p>Call on another student asking, is the MF deviation within +/-0.0025? Meter Factor Deviation: No, 1.0012-0.9985=0.0027 (twenty-seven ten-thousandths) is not within +/-0.0025.</p> <p>Ask the group, overall how comfortable are you verifying the meter factor limits on a LACT proving report?</p>

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3 Min. (Entire Conclusion)	Terminal Objective (Re-Stated)	Great job on the exercise! Let's now review our lesson objective. Call on yet another student, will you please read the objective for us? Given a LACT Proving Report, determine if the meter factor limits are within 43 CFR 3174.11.
	Summary (Each Topic)	In order to reach our objective, we covered the following topics: We went over LACT proving report task knowledge. Ask the following review questions: What is a LACT proving report? Why is it important to verify the LACT proving report? Where are the meter factor limits defined? Next, I showed you how to verify the meter factor limits: First, we verified the unity: The current MF must be between? 0.9900-1.0100. Next, we verified the meter factor deviation: How did we do this? Subtract the previous MF from the current MF. The answer must be within +/-0.0025.
	Transfer (What can the student now do?)	Congratulations! You can now use your new skills to verify a LACT proving report.

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	Close (Tie to Attention Step)	What does this allow you to do? It allows you to ensure oil sales are measured accurately and the American public receives the correct amount of royalties. Well done everyone! Thank you for your participation today.

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