



# Fundamentals of Electric Meter Testing

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# Meter Testing 101

## Metrology

- The science of measurement
- Ensures that commerce and trade is fair and accurate
- Process relies on **standards** and traceability to the SI



# Meter Testing 101

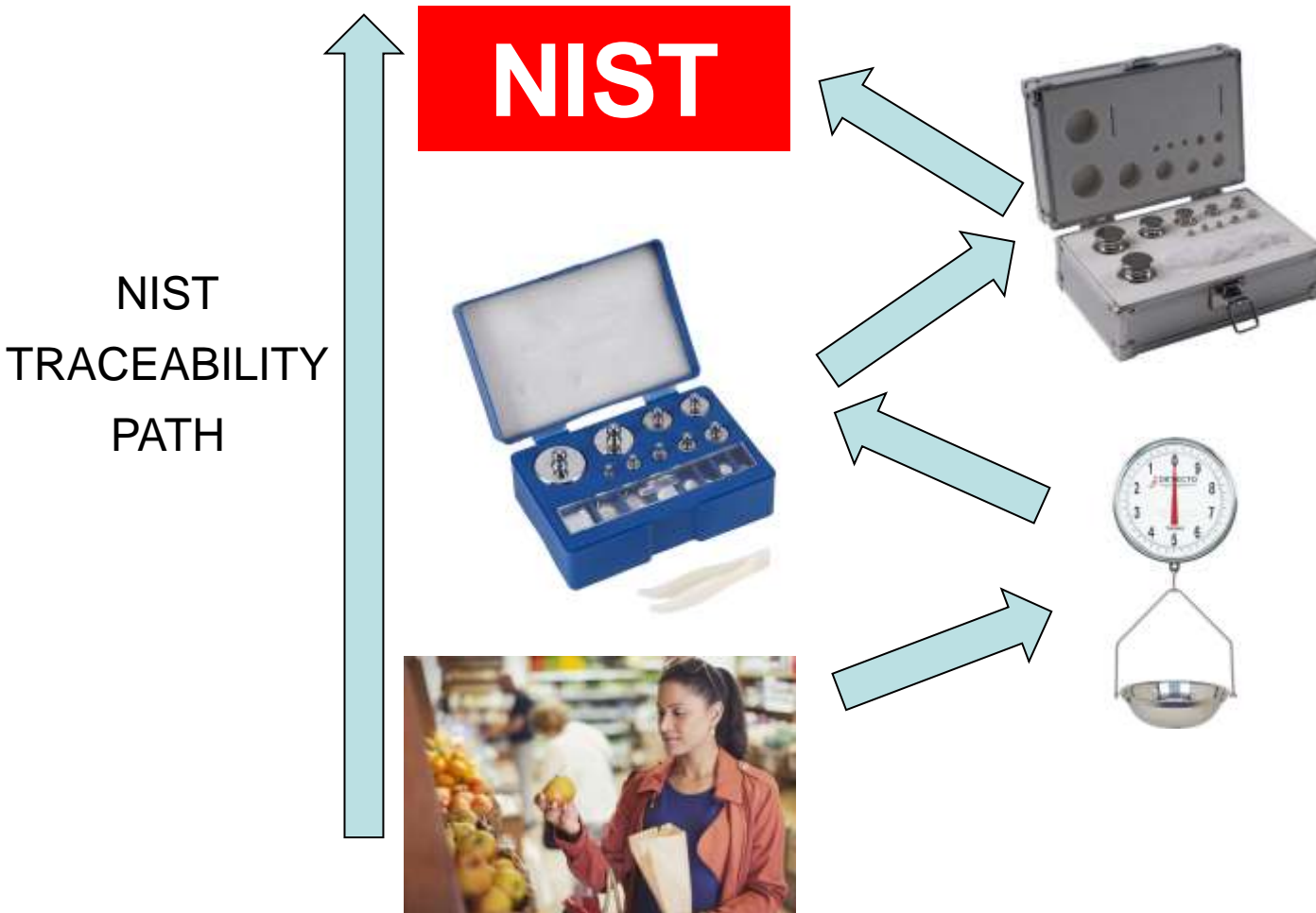
## Reference Standards

- Measurement Device
- Higher accuracy class than the DUT
- Traceability path to a national lab and SI



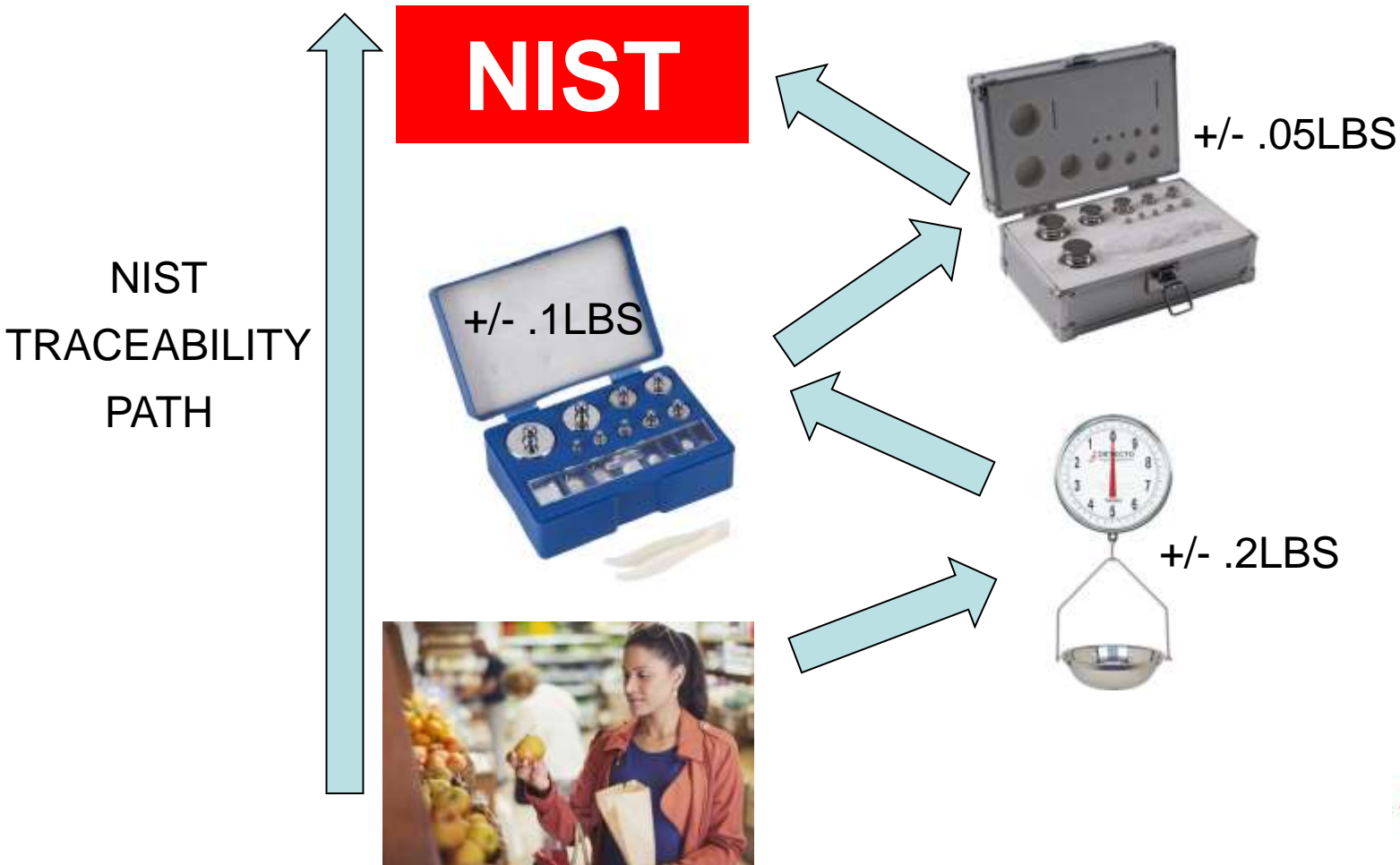
# Meter Testing 101

## Metrology – Apple Example



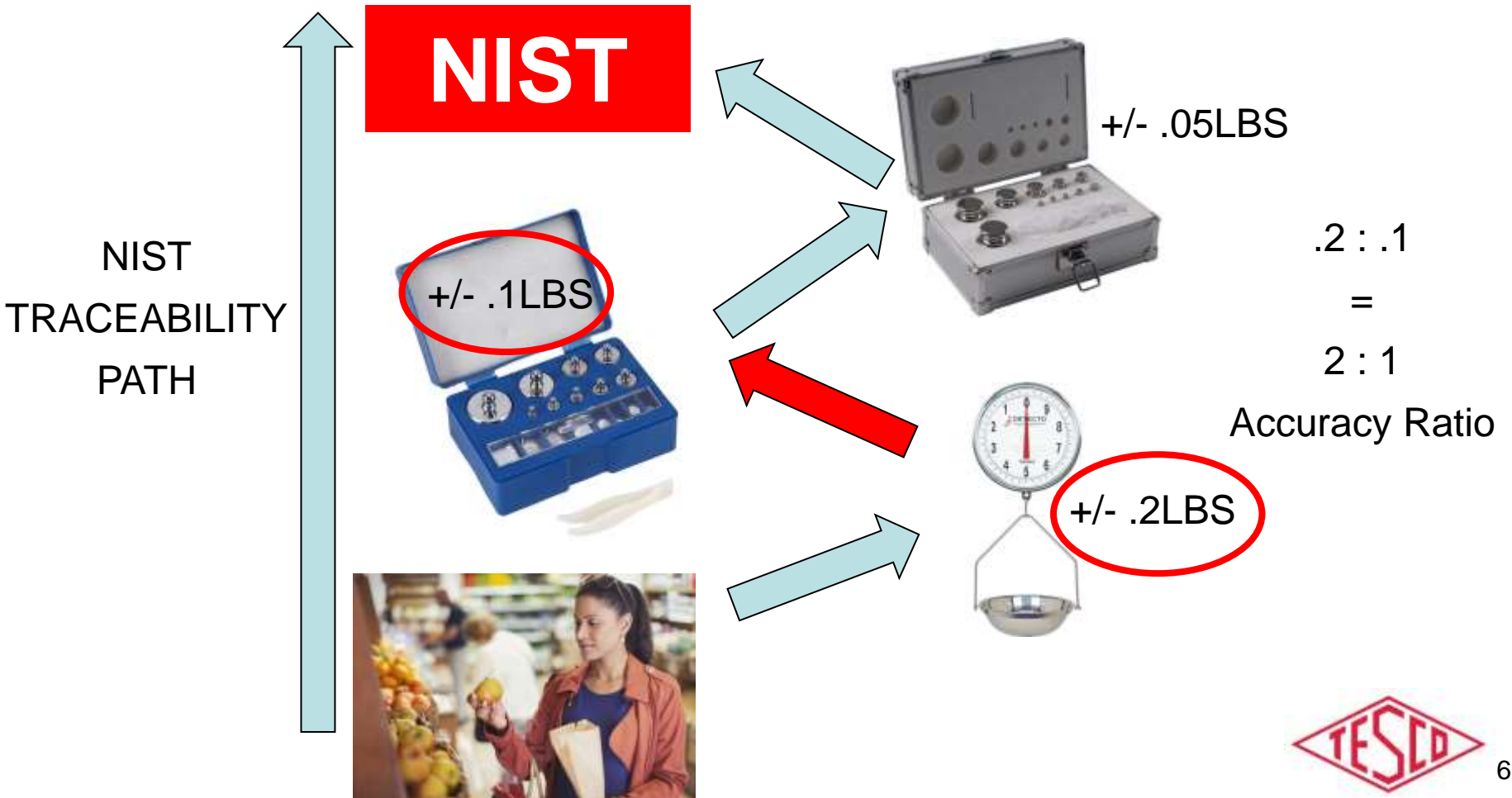
# Meter Testing 101

## Metrology – Accuracy Classes



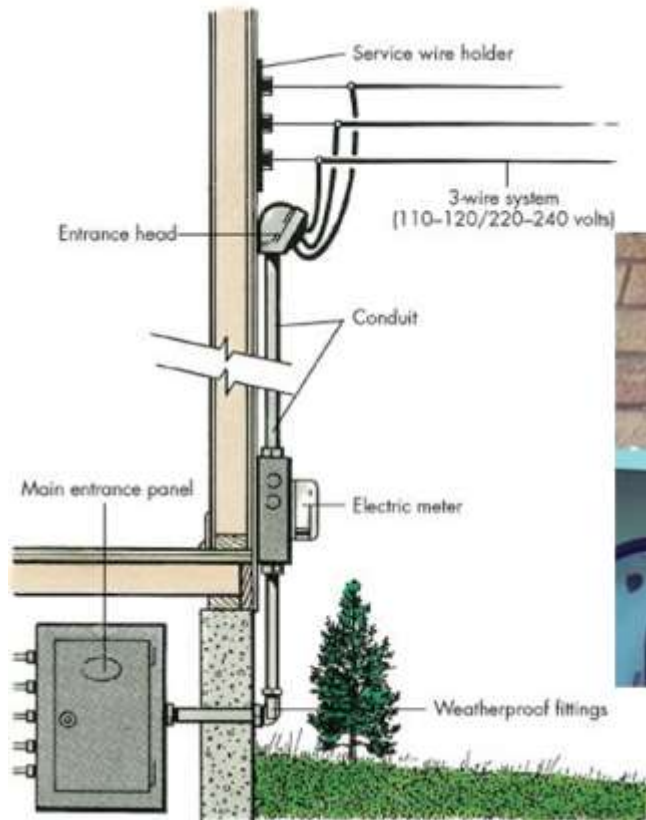
# Meter Testing 101

## Metrology – Accuracy Ratios



# Meter Testing 101

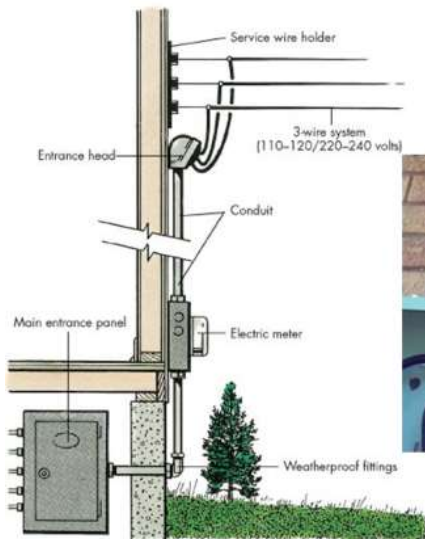
## Electric Meter Testing





# Meter Testing 101

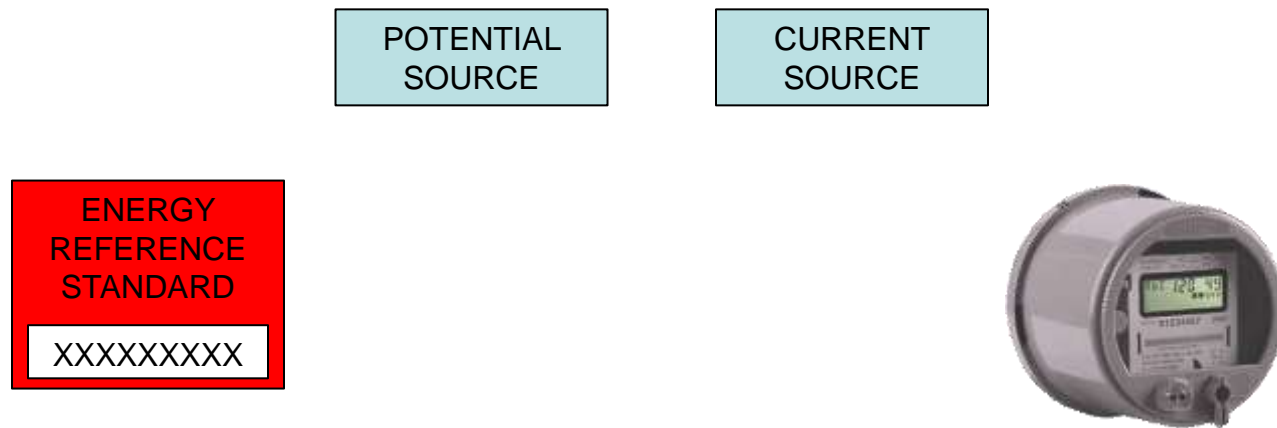
## Electric Meter Testing





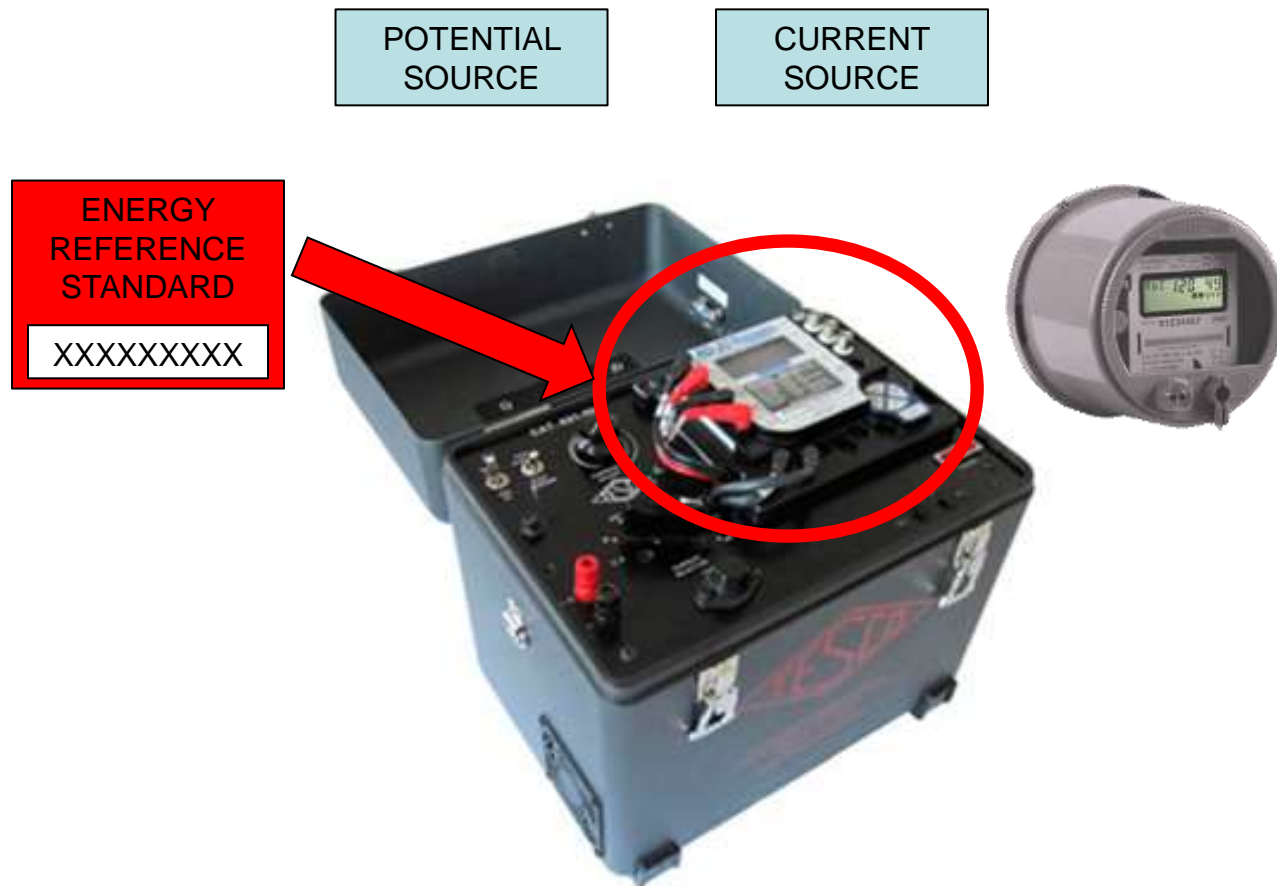
# Testing Theory and Equipment

## Meter Accuracy Testing – A Comparison Test



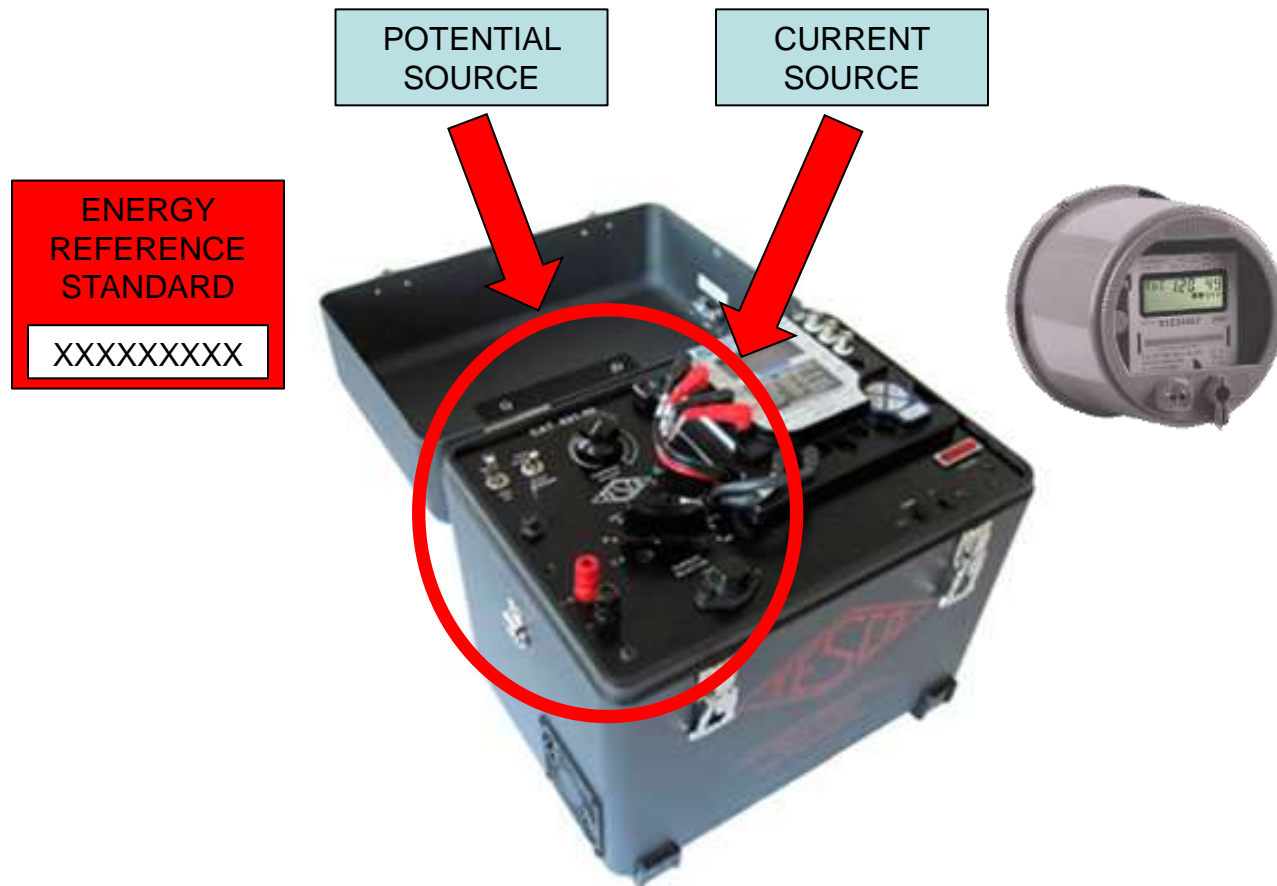
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## Meter Accuracy Testing – A Comparison Test



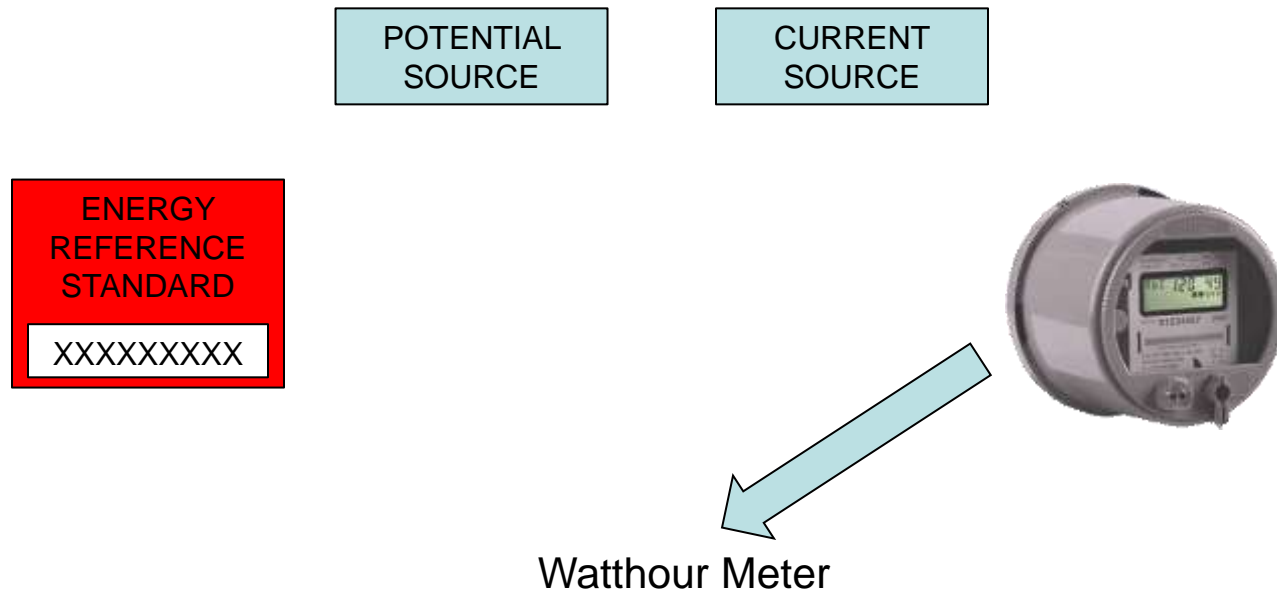
# Testing Theory and Equipment

## Meter Accuracy Testing – A Comparison Test



# Testing Theory and Equipment

## Meter Accuracy Testing – A Comparison Test



- Measures Electrical Energy (kWh)

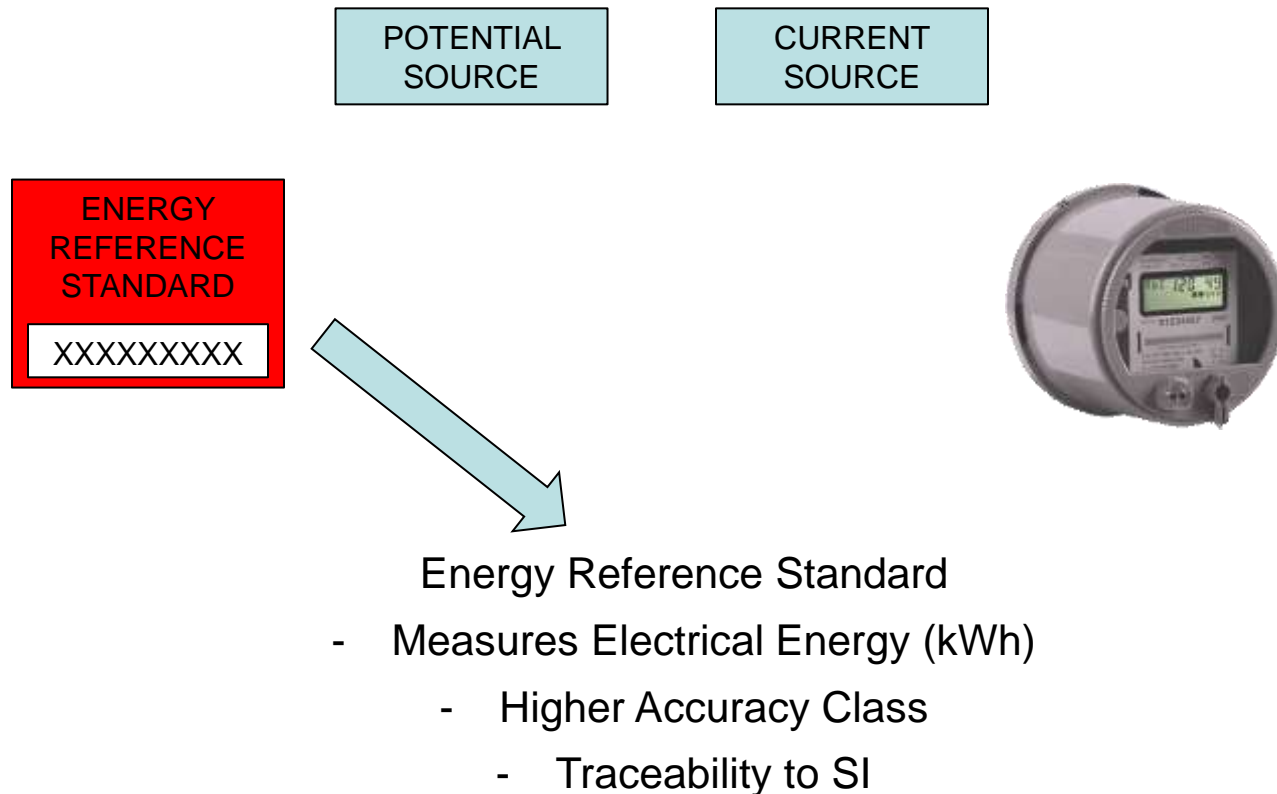
Potential (V) \* Current (I) = Power (W)

Power Over Time = Energy (kWh)



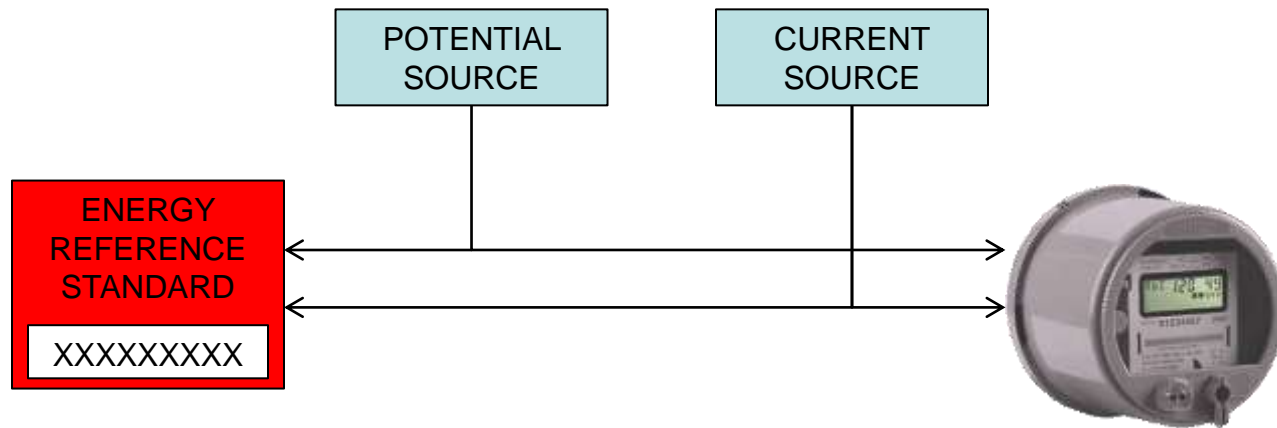
# Testing Theory and Equipment

## Meter Accuracy Testing – A Comparison Test



# Testing Theory and Equipment

## Meter Accuracy Testing – A Comparison Test

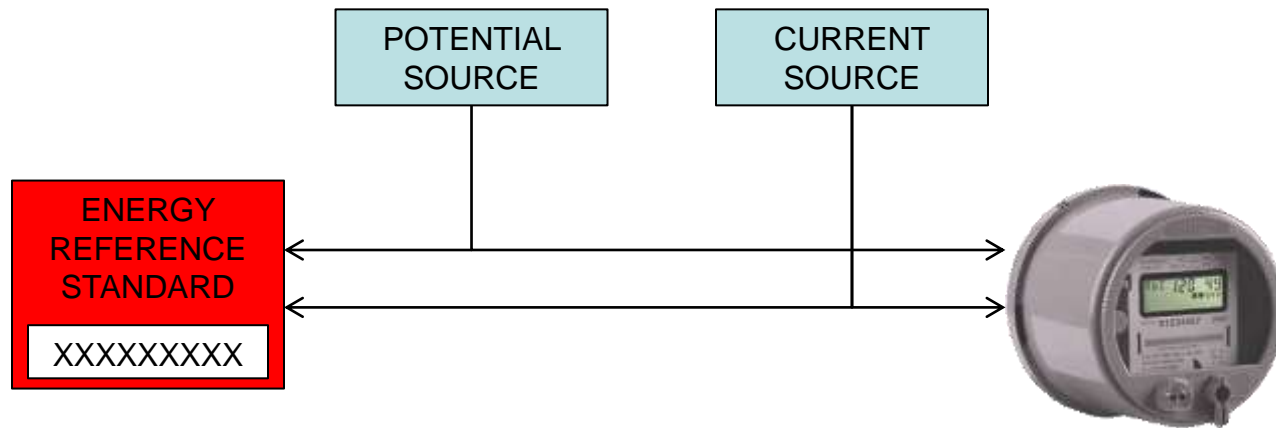


- Apply the Same Voltage and Current to the Standard and Meter for a Defined Period of Time
  - Standard and Meter Should Measure the Same Energy
    - The Difference is the Error of the Meter



# Testing Theory and Equipment

## Meter Accuracy Testing – A Comparison Test



Example:

Standard Registers 100kWh / Meter Registers 101.38

Then the Error of the Meter is 1.38%

# References and Citations

1. <http://www.texasmeter.com/>
2. <https://home.howstuffworks.com/home-improvement/repair/how-to-do-home-electrical-repairs.htm>
3. <https://www.youtube.com/watch?v=SeyojxVonrk>
4. <https://www.tescometering.com/product/tesco-transockets/>
5. <http://www.gecdurham.com/>
6. <https://www.radianresearch.com/>
7. <http://www.brooksutility.com/products/122>



# Questions and Discussion



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This presentation can also be found under Meter  
Conferences and Schools on the TESCO website:

[www.tescometering.com](http://www.tescometering.com)

