

DTS testing

... apple to apple or ... to oranges

ROUND 2



Chris Grodzinski

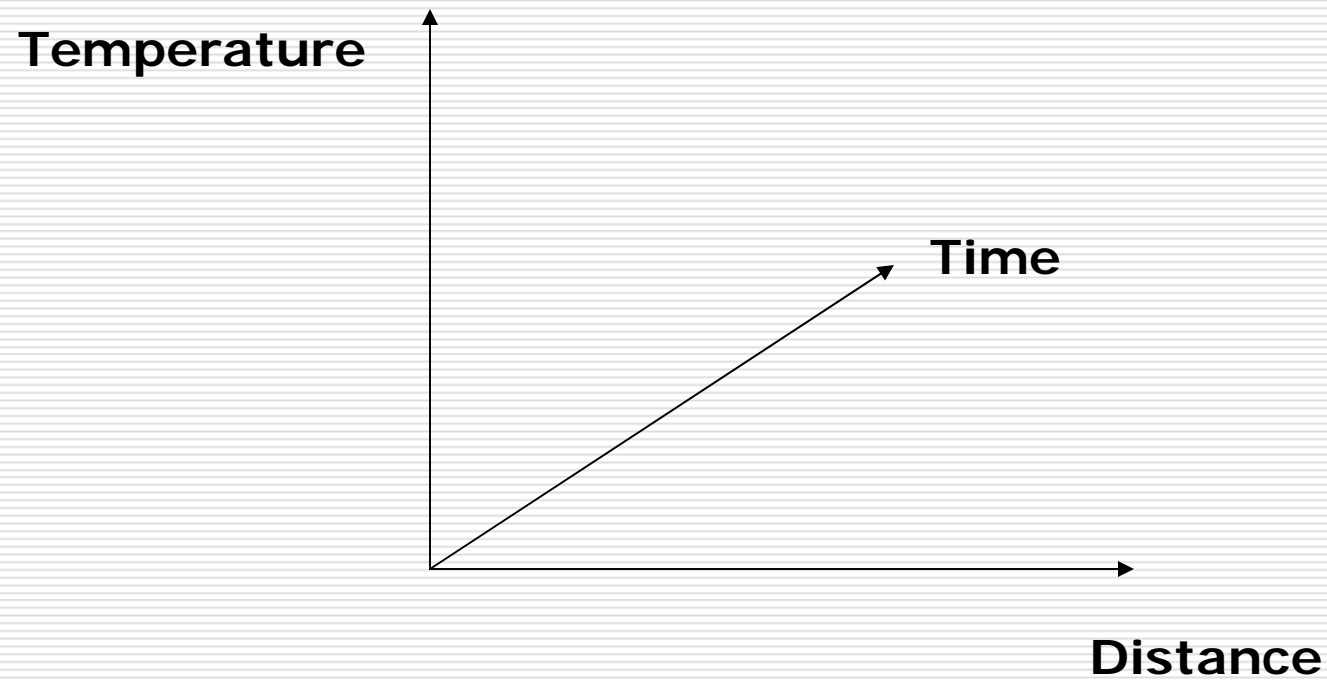
EHV Power Corp. (an



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DTS results

□ "3D" type



What tests to standardize?

Proposition:

- Temperature accuracy
 - Temperature resolution
 - Temperature repeatability
 - Spatial resolution
-

How to test using fiber sensor?

- How long fiber should be used?
 - Testing conditions
 - Which results should be taken into account?
 - Which data to use?
 - How long to test?
 - How to interpret results?
-

How long fiber?

Proposition:

1. The maximum fiber length that manufacturer specified for the DTS.

or

2. The fiber length that is equivalent to the maximum acceptable attenuation.

Test conditions

- Stable fiber temperature
 - Temperature steps and duration
 - Temperature range
 - Environmental conditions for measuring unit
 - Reference meters accuracy
 - Burn-in test duration
-

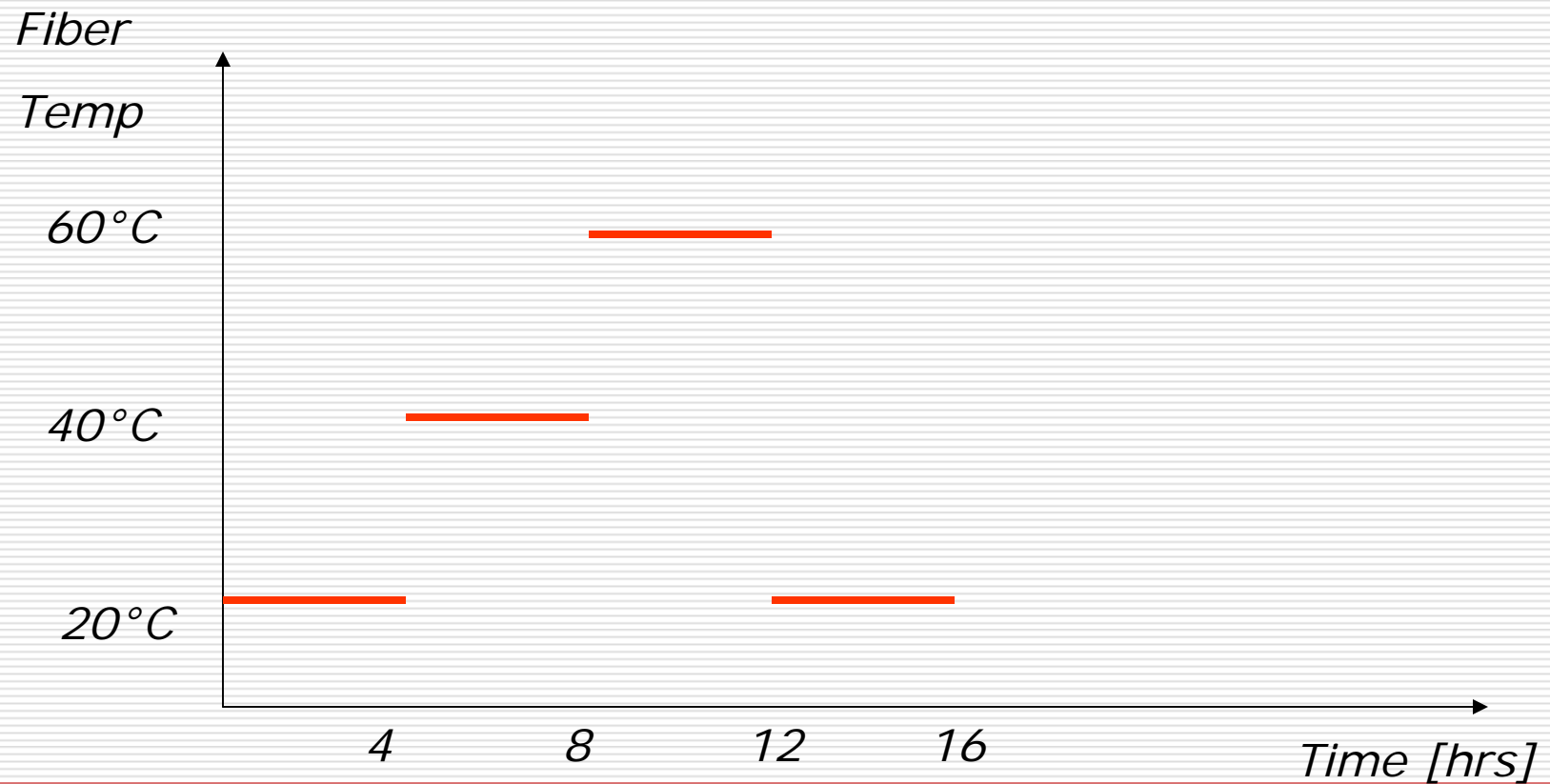
Stable fiber temperature

Proposition:

**The temperature should not change
in the last 30min**

Temperature steps & duration

Proposition:



Environmental conditions

Proposition:

DTS unit should be placed at a min and max specified temperature and temperature stability test performed

Reference meters accuracy

Proposition:

**The reference meters should be at
least 0.2 class**

Burn-in test duration

Proposition:

**The DTS unit should be subjected to
72hrs test prior to fiber test.**

Which results?

Proposition:

Single ended measurement

Which data to use?

Proposition:

Data collected 100m from the fiber end remote to the DTS

and

the length of fiber to collect data = 10 x spatial resolution of the DTS as a minimum.

How long to test?

Proposition:

Measurement times

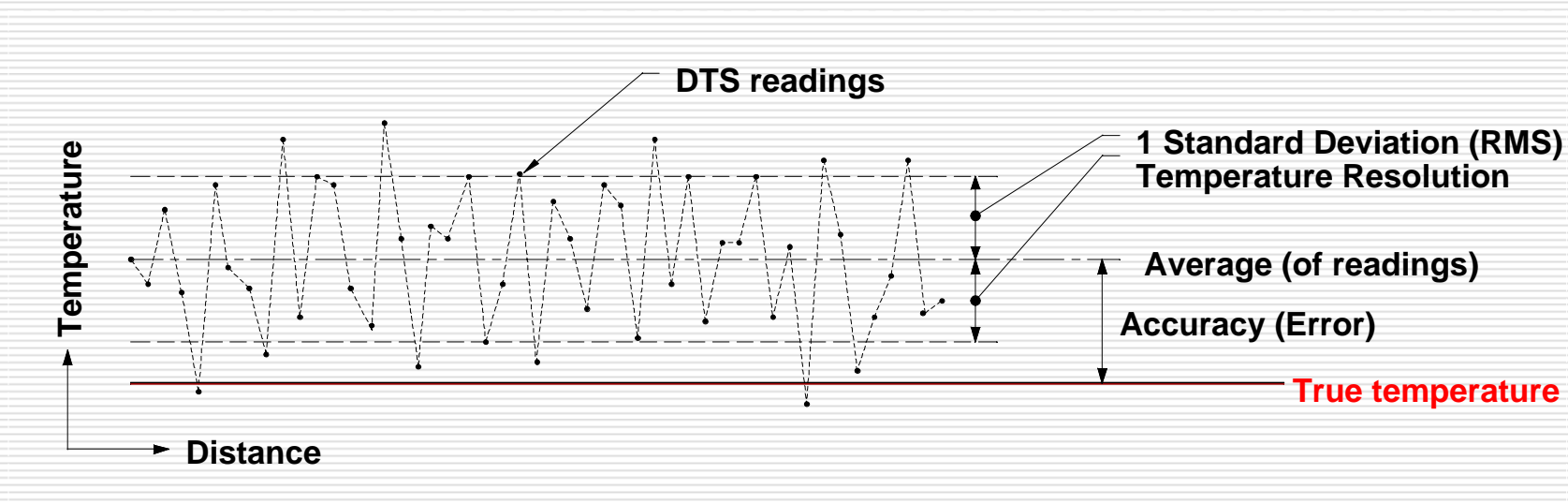
2km fiber length – 1min

5km fiber length – 2min

10km fiber length – 4min

How to interpret results?

- Remember the picture

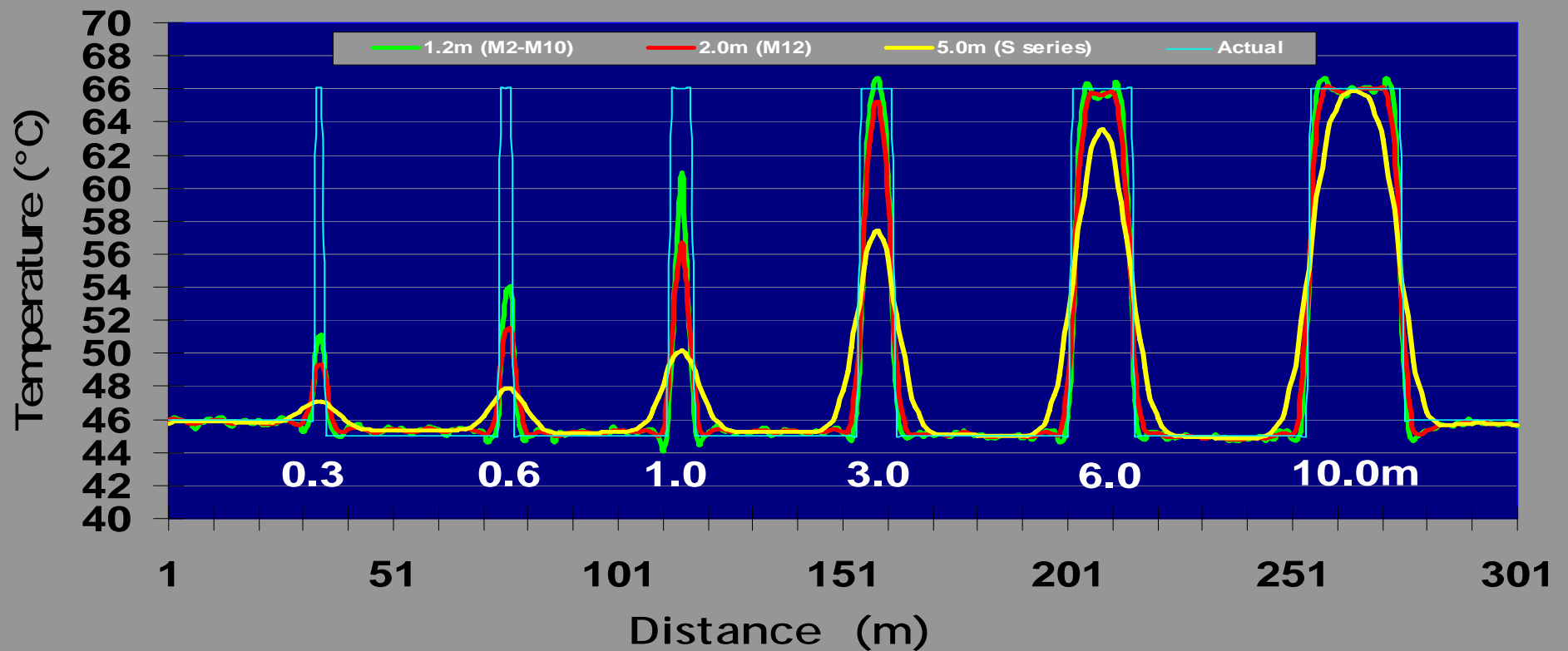


How to interpret results?

1. Average (mean deviation) of the temperature points collected from the suggested distance
 2. Sample standard deviation of the mean for the suggested distance
 3. Standard deviation of the mean calculated for a selected point measured over 10 consecutive scans
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Spatial resolution

Remember the picture



Spatial resolution

Proposition:

Test fiber length equal to 3 x spatial resolution and provide results in a graphic form

Acceptance criteria

**To be specified by manufacturers
???**

Conclusion

- ❑ We have to know how the equipment is tested
- ❑ There is not known standard or guide to test the distributed temperature measuring device
- ❑ We have to know what to expect from the equipment we use
- ❑ We would like to compare different devices based on their performance



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