

## The challenge of achieving accurate models

SC C4

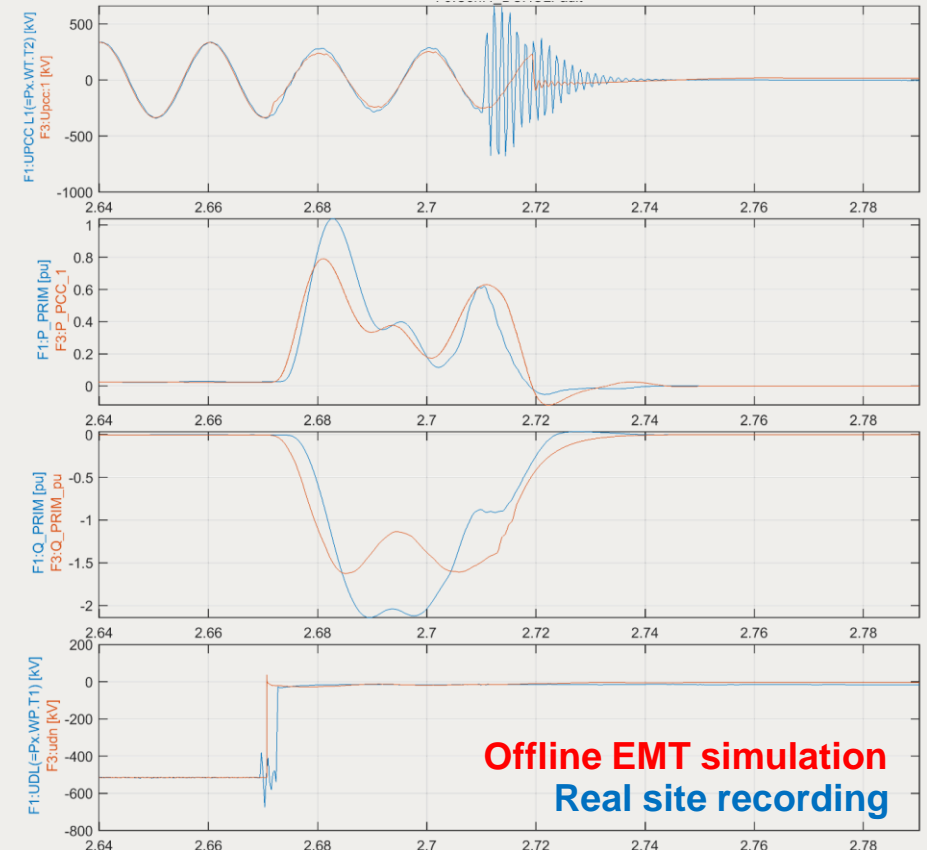
PS 3 – Question 14: What are the worldwide experiences in situations where the overall power system model failed to predict an actual system event or ongoing occurrences of abnormal responses, and were the causes could be deterministically identified and rectified?

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**HITACHI**  
Inspire the Next

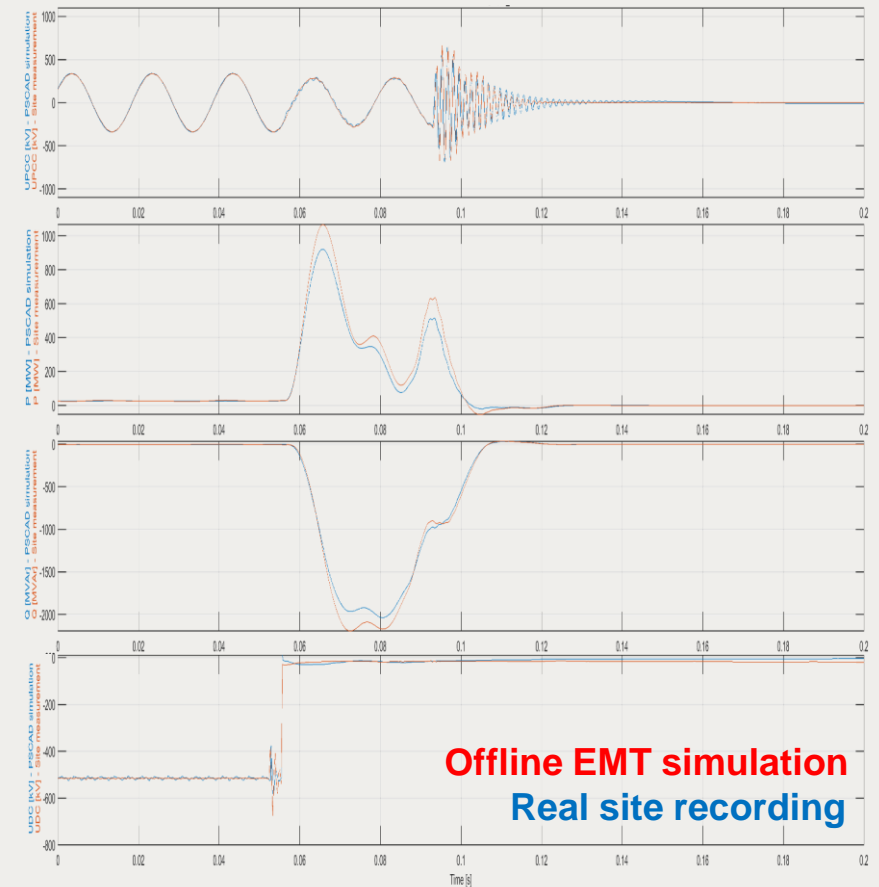
# Is this model accurate?

- Comparisons between simulation and real power systems events rarely overlap.
- Why?
  - Models created for a specific purpose might not be accurate for other purposes.
  - Models often less damped than the reality.
  - Models often include AC network extreme scenarios, even future scenarios.
  - Models' measurements assume that the real measurement equipment is ideal.



# Can the sources of mismatches be found and corrected?

- **In most cases yes**, some common source of mismatches:
  - Breaker opening times
  - Transformer saturation curves
  - Measurement equipment saturation
  - AC configuration changes due to breaker opening in the AC grid
  - Station ground impedance representation
  - Interaction between overhead lines
- **If not**, ask:
  - Are there any other representations of the event which lead to similar behavior?
  - Has the control been modified afterwards?
  - Is the steady state reached for all intermediate signals?



## How to achieve accurate models?

- Information of the event, the AC network configuration, the power flow and the site.
- Accurate models requires time and a network of multidisciplinary experts to discuss with.
- Data management system to store the changes in models and controls at main stages
- Models need to be systematically updated and revised after commissioning, upgrades or service outages.
- No difference between online and offline models.

**Do not expect overlapping curves. A model need to be accurate to a specific purpose, there is no one-size fits all.**