

## **Abstract FRAMily 2018**

The abstract is a suggestion for a presentation of already completed work (without a paper). May 20, 2018, I revised the abstract to make it more concrete.

Title: *Understanding and using the ETTO<sup>1</sup> principle in modelling with FRAM*

Compared to other methods, FRAM has no underlying accident model, like the 'Domino Bricks' or the 'Swiss Cheese'. The basis of FRAM is four principles: 1) '*Equivalence of successes and failures*', 2) '*Approximate adjustments*', 3) '*Emergence*' and 4) '*Functional Resonance*'. This presentation focuses on the first and second principle.

The first principle states that in a complex socio-technical system, individuals and groups of individuals must adjust to the current conditions in everything they do. The adjustments are the reason why everyday work is safe and efficient and the reason why things sometimes go wrong. In a system, time, information and resources are finite and individuals must balance between efficiency and thoroughness, e.g. the time they use to think and the time they use to act. Due to this balance – the ETTO (Efficiency-Thoroughness-Trade-Off) - the adjustments will always be approximate, as stated in the second principle.

The behaviour of individuals and groups of individuals is not random and represents a certain regularity. A set of work ETTO rules described in the literature<sup>2</sup> can explain and predict the behaviour of individuals when adjusting everyday work to the actual situation. The rules do not constitute causes of the behaviour, but describes the behaviour '*as if*' the individual followed one of the rules.

After more than six years of experience with FRAM modelling in a Danish Health Care setting, the ETTO rules have become more and more important in my work, especially to identify risks in existing workflows and in the design of new workflows.

In my presentation, I will demonstrate how the actual behaviour of individuals identified in a FRAM analysis in a Danish health care setting relates to one or more of the ETTO rules and how the ETTO rules made it possible to predict the behaviour of individuals and therefore the potential functional resonance in a workflow.

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<sup>1</sup> ETTO = Efficiency-Thoroughness-Trade-Off

<sup>2</sup> Hollnagel E (2009). The ETTO Principle – Efficiency-Thoroughness-Trade-Off: Why things that go right sometimes go wrong. Ashgate Publishing, Farnham, Surrey, UK

A set of TETO work rules have not been developed yet