

#### **Assignment 4 SWEN421 2020 [25 marks]**

##### **The second refinement step for the Event B Steam Boiler solution**

In assignment 3 you read the *A Case Study in Refinement-Based Modelling of a Resilient Control System* paper. Where the problem and it's solution is explained both in English and as Event B models. Assignment 3 asked you to build the TLA+ equivalent of the Event B models M0 and M1 plus model check the first refinement step - that M1 is a refinement of M0.

Here in Assignment 4 you need establish the second refinement step:

1. **[5 marks]** Build a TLA+ (PlusCal) version of the Event B M2 machine
2. **[10 marks]** Document and model check as many of the Functional and safety requirements, listed in Table 2 and Table 3 of the Event B paper, as you can. Add documentation to your TLA+ using the same IDs as in the paper.
3. **[10 marks]** Model check that M2 is a refinement of M1

Clearly you need to have attempted Assignment 3 (part 3) before you can attempt Assignment 4 (part 3). If you improve any of your Assignment 3 work this will be taken into account and your mark for Assignment 3 will be improved.