TE-CRG-OA

Beam screen and IT
Calibration during TS2 and first results

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BS calibration method

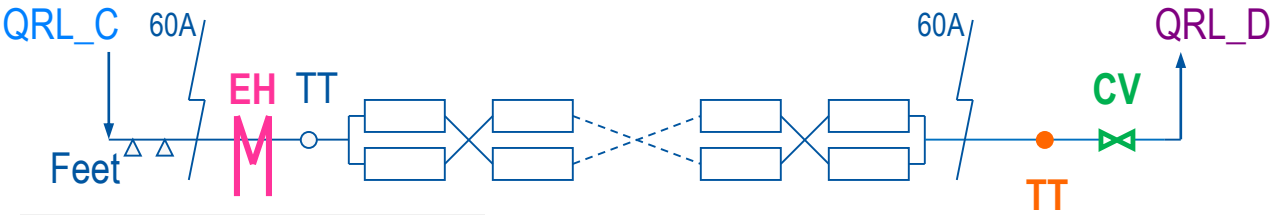
Reminder (LMC 15/10/15)

Procedure description

A reference fill is used to determine the average valve position and average outlet temperature after injection and ramp.

The electrical heater power injected to reach the above temperature is compared with the QBS extracted from data storage.

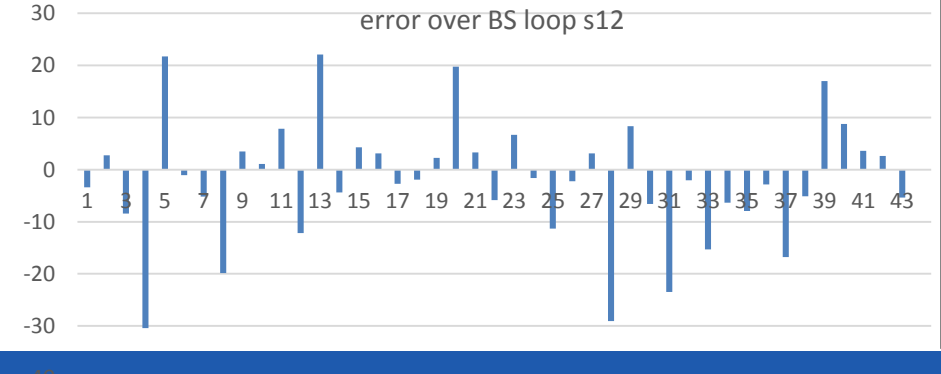
Valve in fixed position
= reference fill position

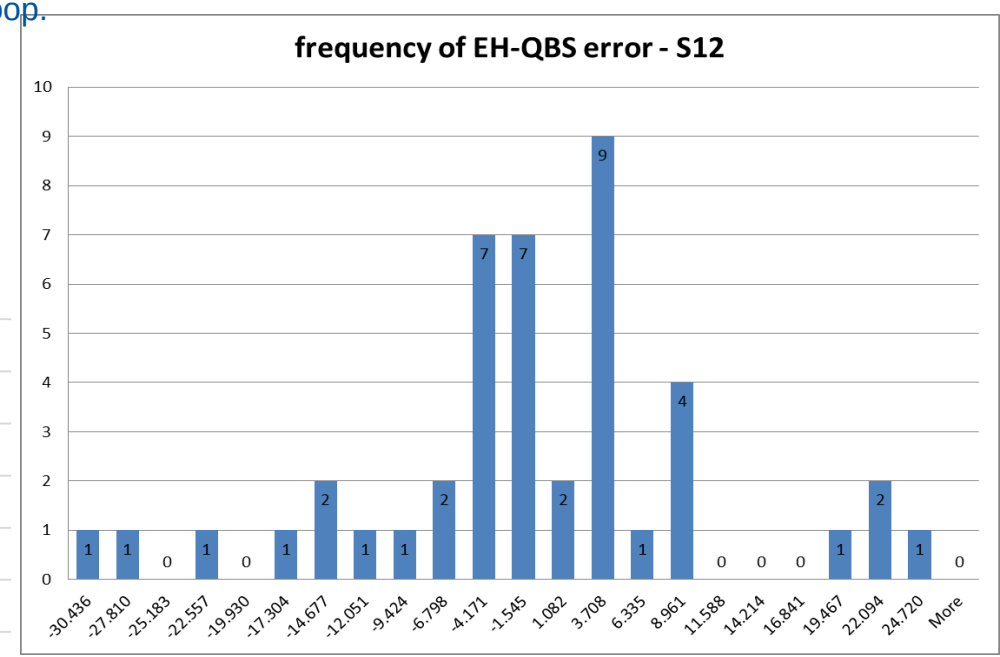


Electrical heating power to reach the TT out = reference fill temperature

BS calibration S12 results

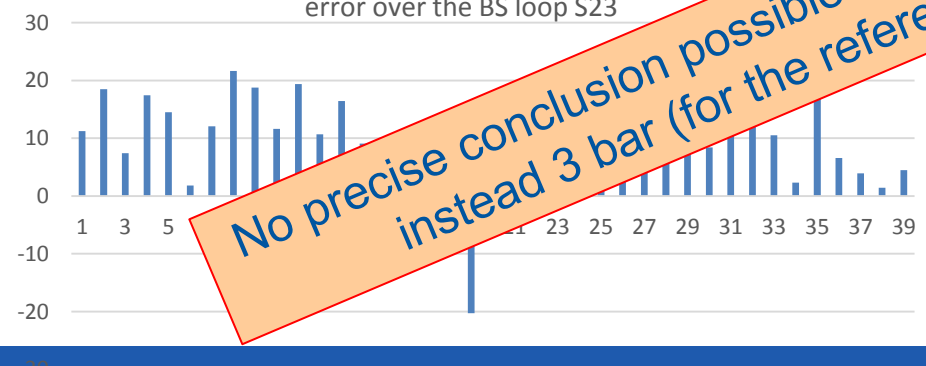
- S12 test gives a thermal load displayed (QBS) over-estimated of about ~ 2%.
  - QBS > EH_{test}
    - 44 BS loop tested over the 52 initially possible loop.
    - Average error (%) : -2.0% ±1.7
    - Standard deviation : 11.5
    - Standard error : 1.7
    - Avg QBS expected : 110 W
    - QBS from PVSS (for 52 BS loop) : 108 W
    - Avg EH of the test : 105 W

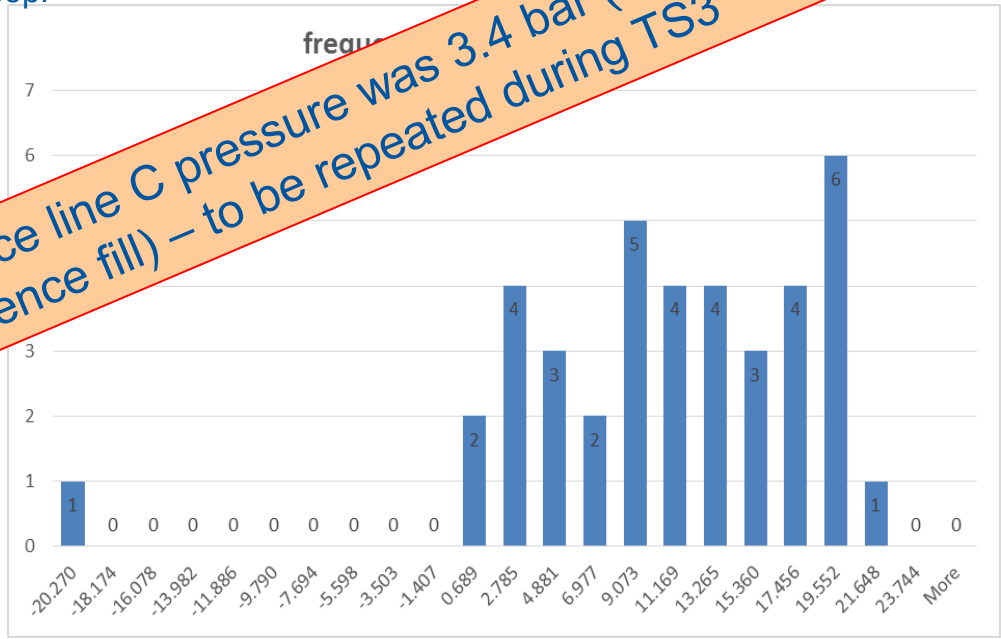




BS calibration S23 results

- S23 test gives a thermal load displayed (QBS) under-estimated of about ~ 9.7%
  - QBS < EH_{test}
    - 39 BS loop tested over the 51 initially possible loop.
    - Average error (%) : 9.7% ±1.2
    - Standard deviation : 7.9
    - Standard error : 1.2
    - Avg QBS expected : 92 W
    - QBS from PVSS (for 52 BS loop) : 94 W
    - Avg EH of the test : 97 W

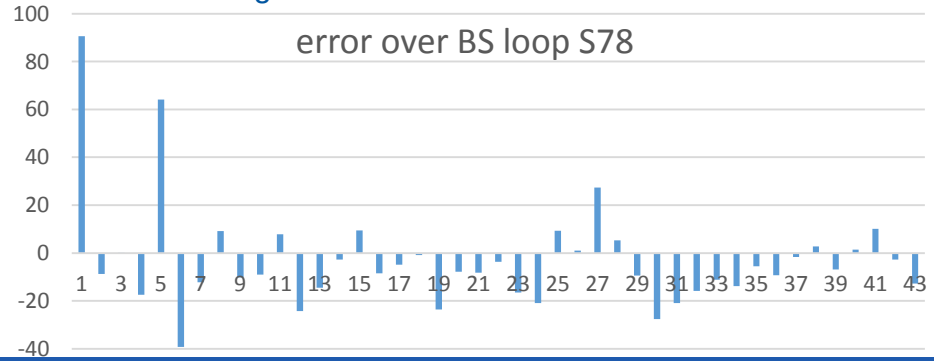


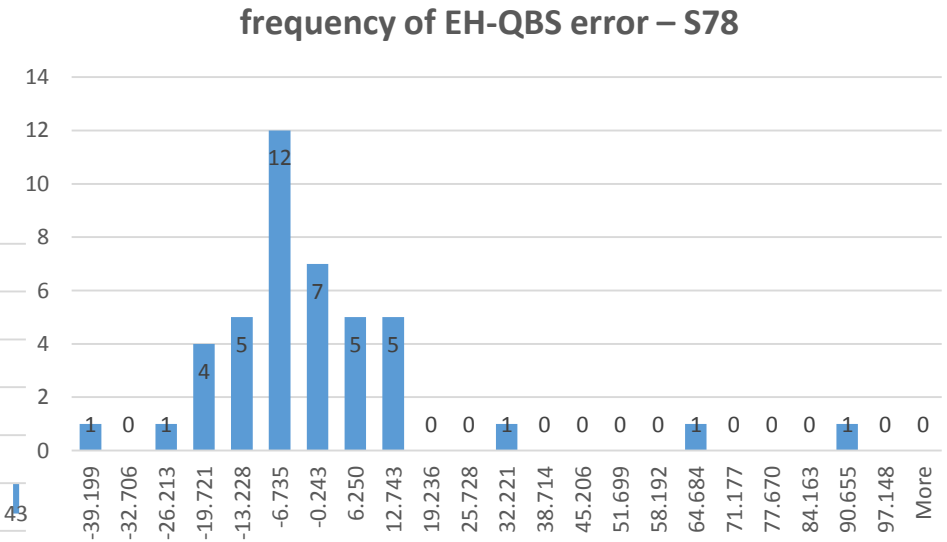


No precise conclusion possible since line C pressure was 3.4 bar (for the test) instead 3 bar (for the reference fill) – to be repeated during TS3

BS calibration S78 results

- S78 test gives a thermal load displayed (QBS) over-estimated of about ~ 3%.
  - QBS > EH_{test}
    - 43 BS loop tested over the 59 initially possible loop.
    - Average error (%) : -3.0% ±3.3
    - Standard deviation : 21.7
    - Standard error : 3.3
    - Avg QBS expected : 89 W
    - QBS from PVSS (for 59 BS loop) : 87.6 W
    - Avg EH of the test : 86 W





Beam screen calibration S12 & S23 results

- Calibration test was performed with average valve opening of 50%. → Calculation correction of QBS applied during TS1-2016 presents good results for the high opening of valves.
- (calibration test performed in October 2015 for S45 (LMC 14/10/2015) was performed with 30% opening of valve)