ExTAG(Cannes/WG10)06

INTERNATIONAL ELECTROTECHNICAL COMMISSION SYSTEM FOR CERTIFICATION TO STANDARDS RELATING TO EQUIPMENT FOR USE IN EXPLOSIVE ATMOSPHERES (IECEx SYSTEM)

Title: Presentation Report from Mr Tim Krause re xTAG WG10, IECEx PTP. Agenda item 7.4 of Agenda document ExTAG/517C/DA -

Circulation to: Members of the ExTAG

Introduction

This document contains the ppt presentation from the Convener of ExTAG WG10, Mr Tim Krause as presented during the during the 2018 Cannes ExTAG Meeting.

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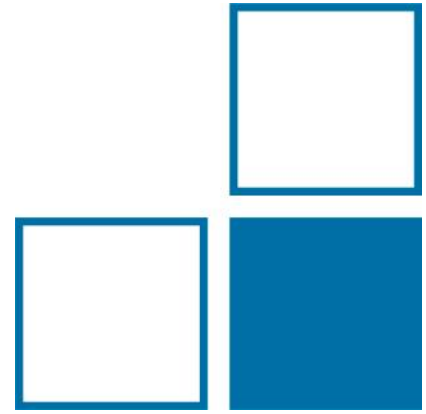
Report from ExTAG WG10

Proficiency Testing

Tim Krause, ExTAG, Cannes, 18th of September 2018



News about the IECEx PT Program

- The two current programs/test rounds of cycle 2017/2018 are

"Explosion Pressure – Test Round 2017" and "Pressurized Enclosure – Test Round 2017".

- Program "Explosion Pressure - Test Round 2010" was closed and is therefore not available anymore.

- There are currently seven programs available:
  - Spark Ignition – Test Round 2010
  - Flame Transmission – Test Round 2013
  - Temperature Classification – Test Round 2013
  - Electrostatic Charge – Test Round 2015
  - Intrinsic Safety – Test Round 2015
  - Explosion Pressure – Test Round 2017
  - Pressurized Enclosure – Test Round 2017

News about the IECEx PT Program

- The test samples for programs “Spark Ignition” and “Temperature Classification” are running out slowly. To ensure that each available program can be performed by any accepted ExTL or applicant ExTL, PTB as the Proficiency Testing Provider holds back three test samples for each of these programs for using them as short-term items on loan. This guarantees that the programs are available until new test samples have been produced or the mentioned programs have been replaced by new programs. It is planned to develop a new “Intrinsic Safety” program to replace the program “Spark Ignition – Test Round 2010” soon.

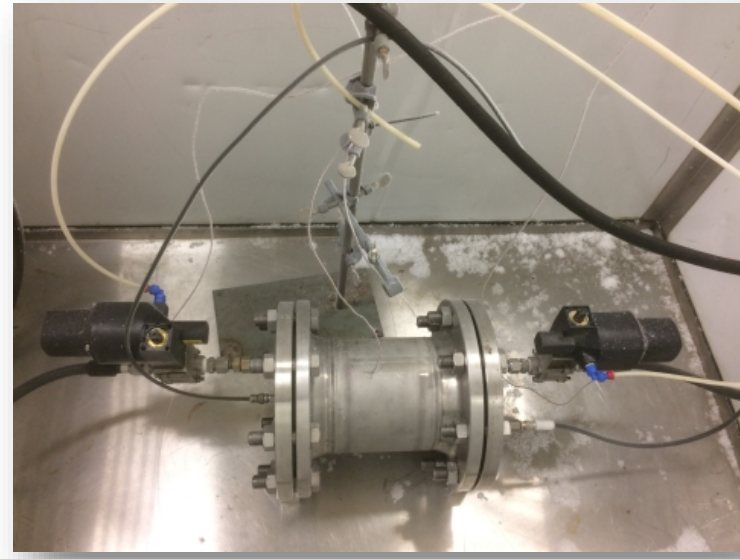
Program „Explosion Pressure – Test Round 2017“

Normative background:
IEC 60079-1

Measurand of interest:
Explosion pressure (reference pressure)

Principle: Measuring the explosion pressure after ignition of an explosive gas-air mixture in explosion vessels with two different configurations at different temperatures

Scope: Two configurations, two explosive gas-air mixtures ((31 ± 1) % Hydrogen (IIC) & (8 ± 0.5) % Ethylene), two ambient temperatures (normal temperature and ambient temperature of -40 °C), five ignitions for each configuration, temperature and mixture



Program „Pressurized Enclosure – Test Round 2017“

Normative background:
IEC 60079-2

Measurand of interest:
Determination of maximum leakage rate & gas concentration

Principle & Scope:

- Determination of maximum leakage rate at the maximum overpressure
- 2. Filling with CO_2 until concentration of 70 % is reached at each measuring point. Rinsing with air until concentration of CO_2 is less than 0.25 %
- 3. Filling with He until concentration of 70 % is reached at each measuring point. Rinsing with air until concentration of He is less than 1 %

Status of the new programs

Status of the current programs 2017/2018 “Explosion Pressure” and “Pressurized Enclosure”

- **Status of program “Explosion Pressure”:**
  - A total of 70 Ex laboratories have registered for the program. 16 ExTLs or applicant ExTLs have not yet registered although they have the standard IEC 60079-1 in scope.
  - The schedule of the program was slightly delayed until the end of Phase I. Meanwhile, the schedule is back on time.
  - Phase I of the program is completed and the interim report was published in June 2018.
  - Currently, Phase II of the program runs. The deadline for repeating the tests and uploading the results of Phase II was the 31st of August 2018.
  - The final report will be published in September/October 2018.
  - The program will be completed after publication of the final report.
  - The corresponding PT Workshop was held at PTB in June 2018 with 80 participants.

Status of the new programs

Status of the current programs 2017/2018 “Explosion Pressure” and “Pressurized Enclosure”

- **Status of program “Pressurized Enclosure”:**
  - A total of 62 Ex laboratories have registered for the program. 15 ExTLs or applicant ExTLs have not yet registered although they have the standard IEC 60079-2 in scope.
  - Due to the high complexity of the test samples and the resulting high expenses of the homogeneity tests, the shipment was delayed by approximately three months. As consequence, the schedule has been updated and new deadlines have been set.
  - Phase I of the program is completed and the interim report was published in July 2018.
  - Due to certain circumstances, it was decided that all participants are asked to repeat the test for Phase II with some modifications and improvement of the test sample as well as documentation.
  - Currently Phase II of the Program runs. The deadline for repeating the tests and uploading the results of Phase II is the 30th of November 2018.
  - The final report will be published in December 2018/January 2019.
  - The program will be completed after publication of the final report.
  - The corresponding PT Workshop was held at PTB in June 2018 with 75 participants.

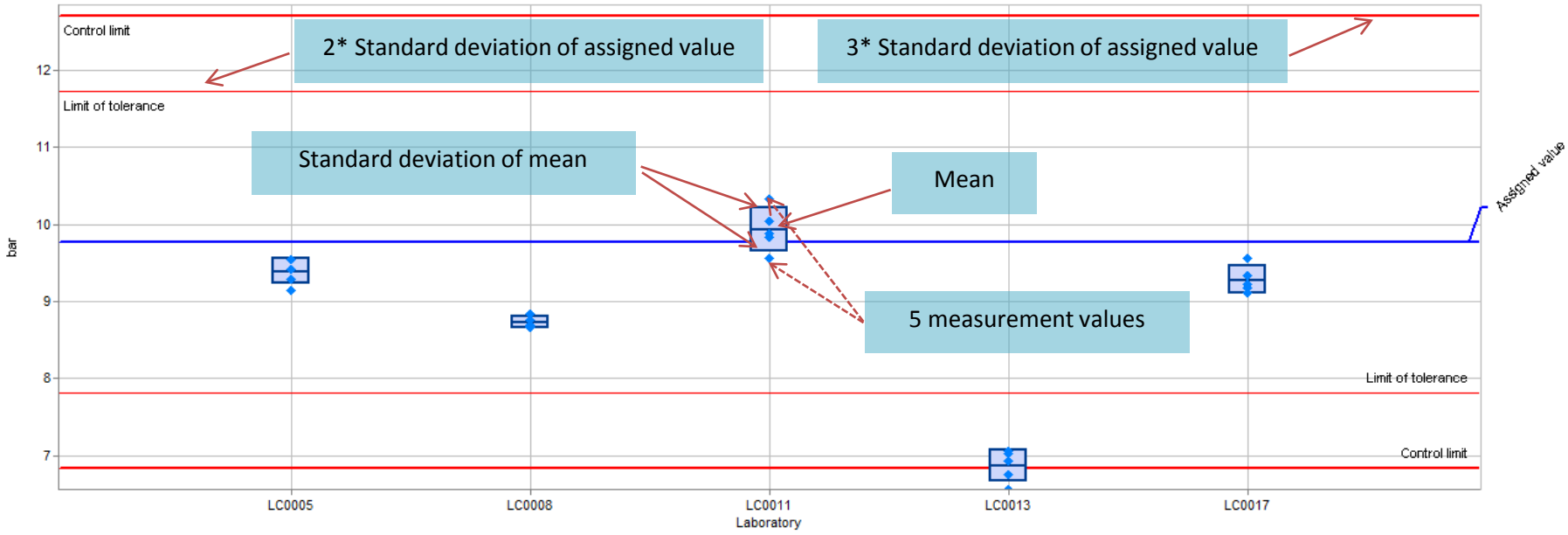
Status of the new programs

New structured Phase II of program “Pressurized Enclosure”

Since the program “Pressurized Enclosure – Test Round 2017” was the first proficiency testing program in the field of pressurized enclosures and dilution measurements according to IEC 60079-2, the provider has received lots of questions regarding the procedure and the equipment from the participants. Furthermore, the ongoing discussion within the internal group of PTB experts and with the participants during Phase I showed certain weaknesses of the procedure and potential for improvement. That is why Phase I serves as a pilot/validity phase and it was decided that all participants are asked to repeat the test for Phase II with some modifications and improvement of the test sample as well as documentation. These modifications support the program understanding and increase comparability. The modifications are described in the updated procedure instruction.

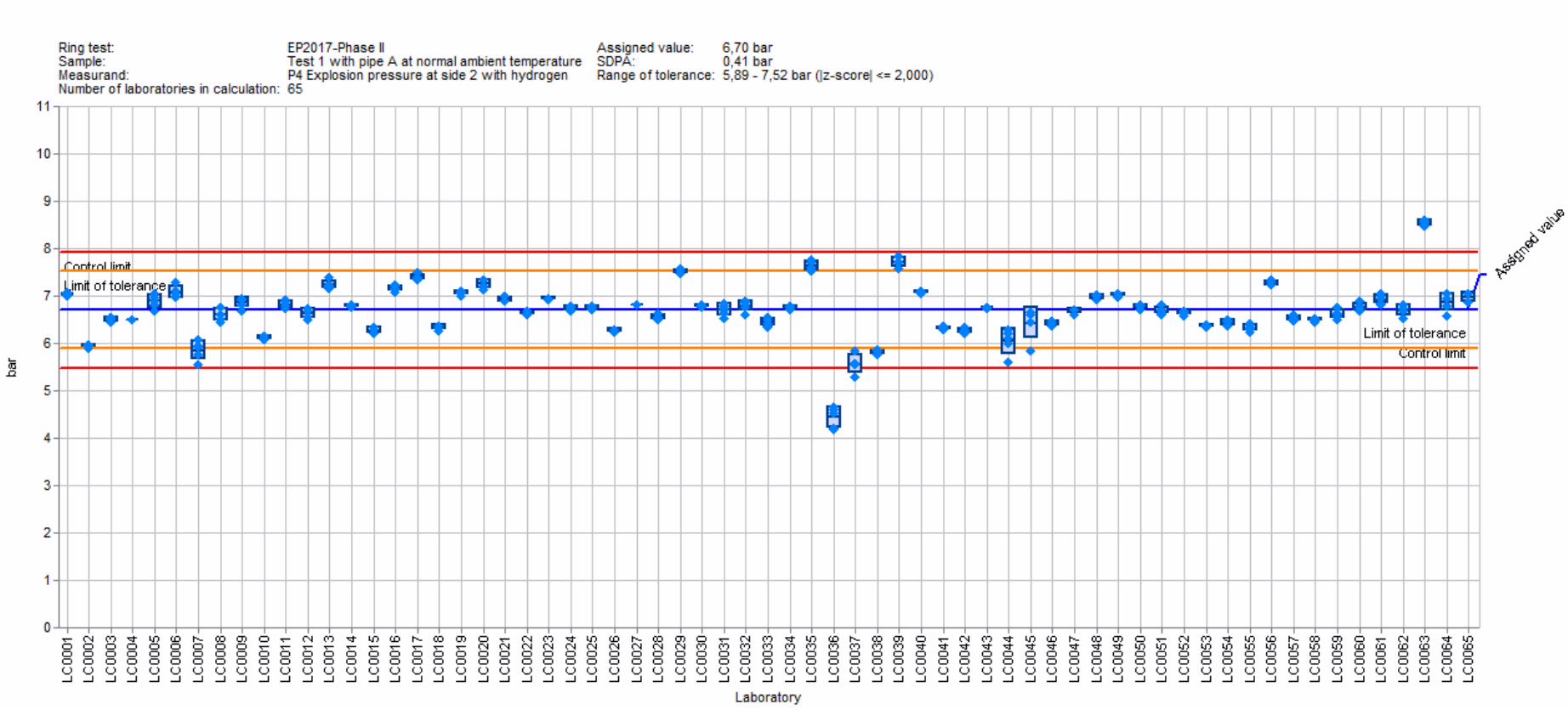
Results of the current PT Program “EP2017”

Explanation of the graphic presentation for participants results



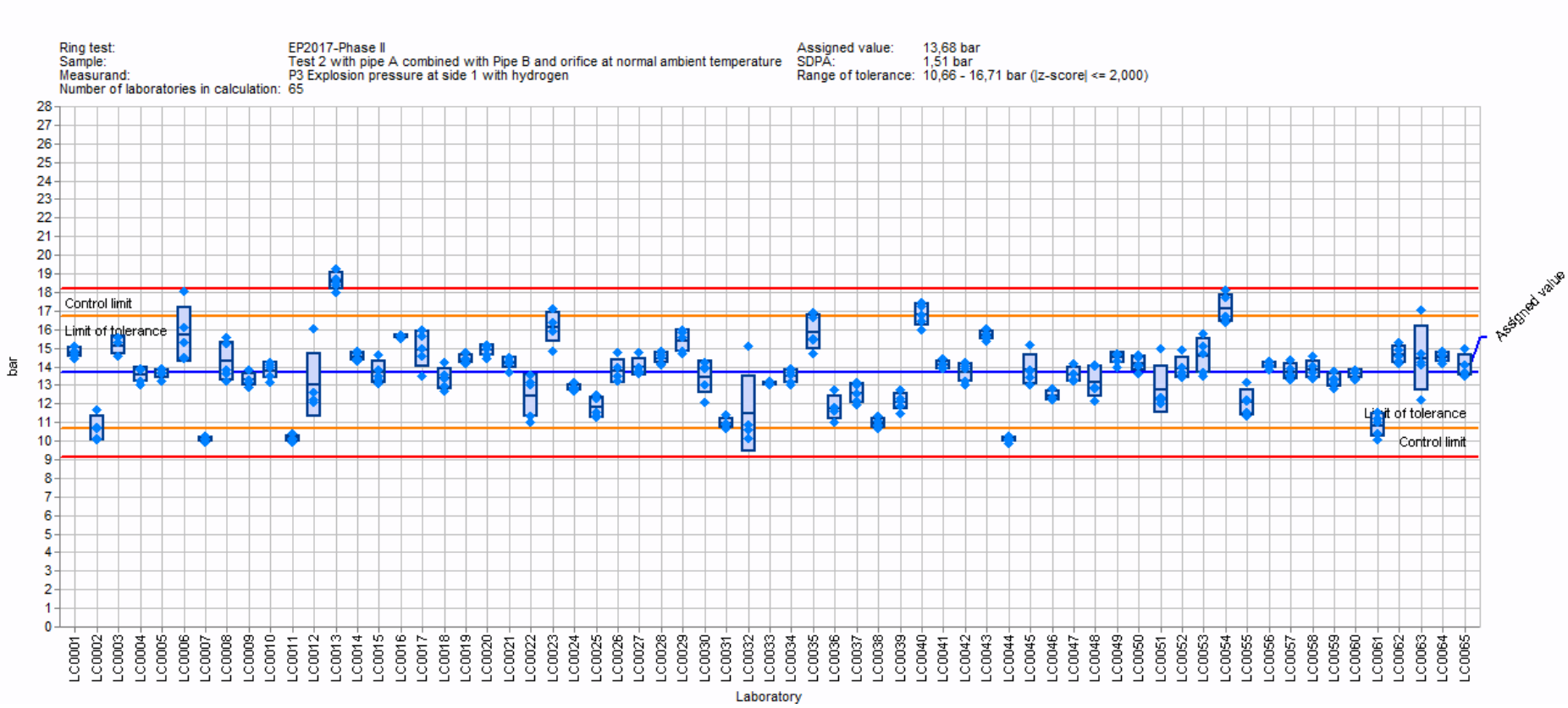
Results (Phase II)

Configuration a); Hydrogen; Side 2, at normal ambient temperature



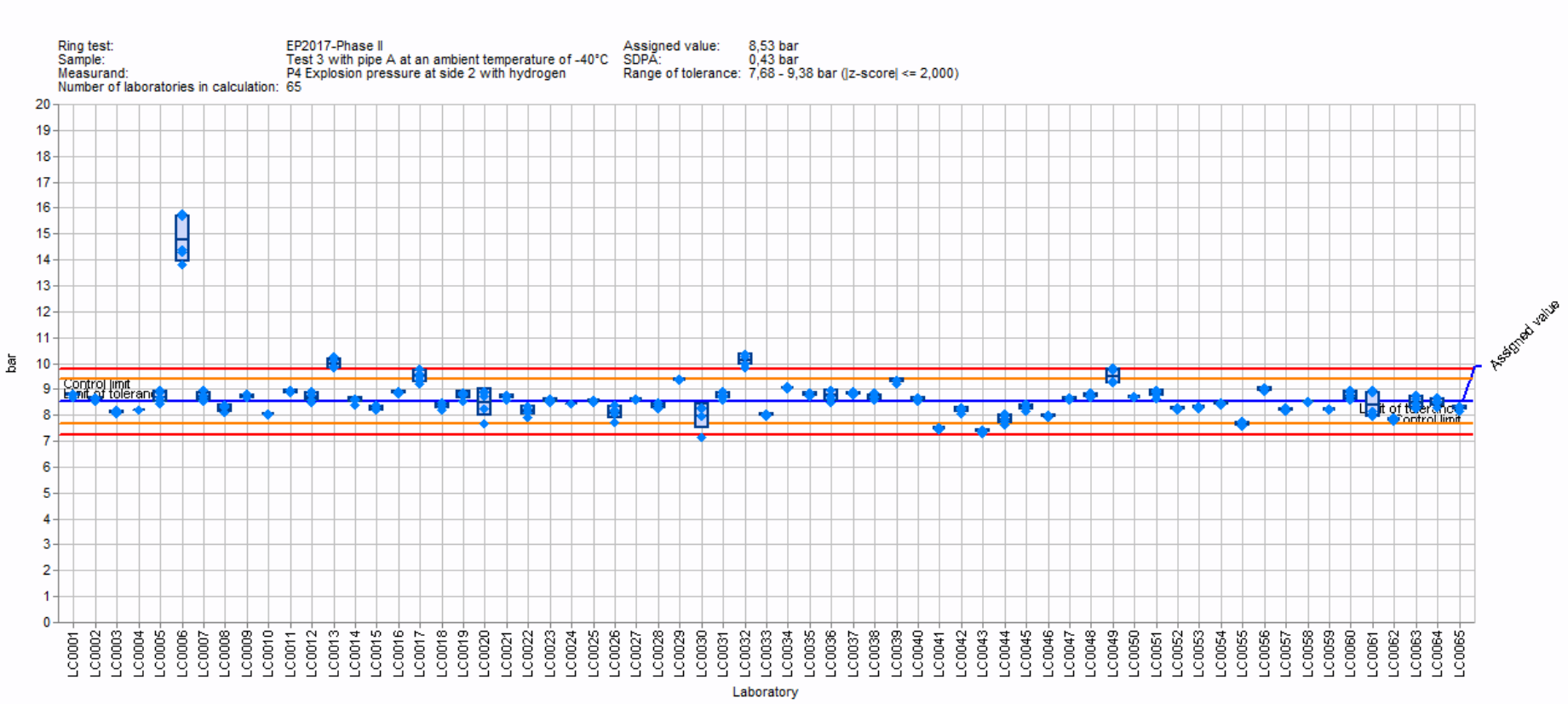
Results (Phase II)

Configuration b); Hydrogen; Side 1, at normal ambient temperature



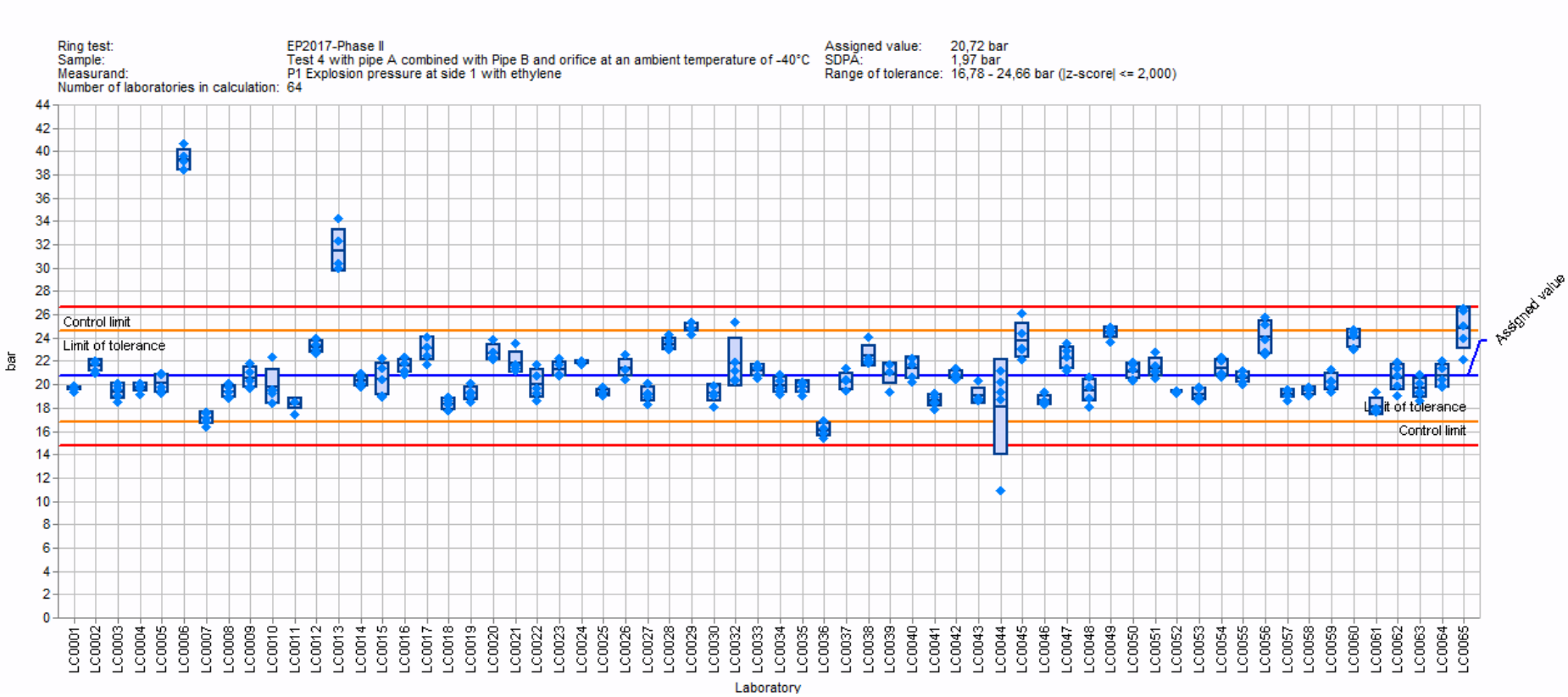
Results (Phase II)

Configuration a); Hydrogen; Side 2, at an ambient temperature of -40°C



Results (Phase II)

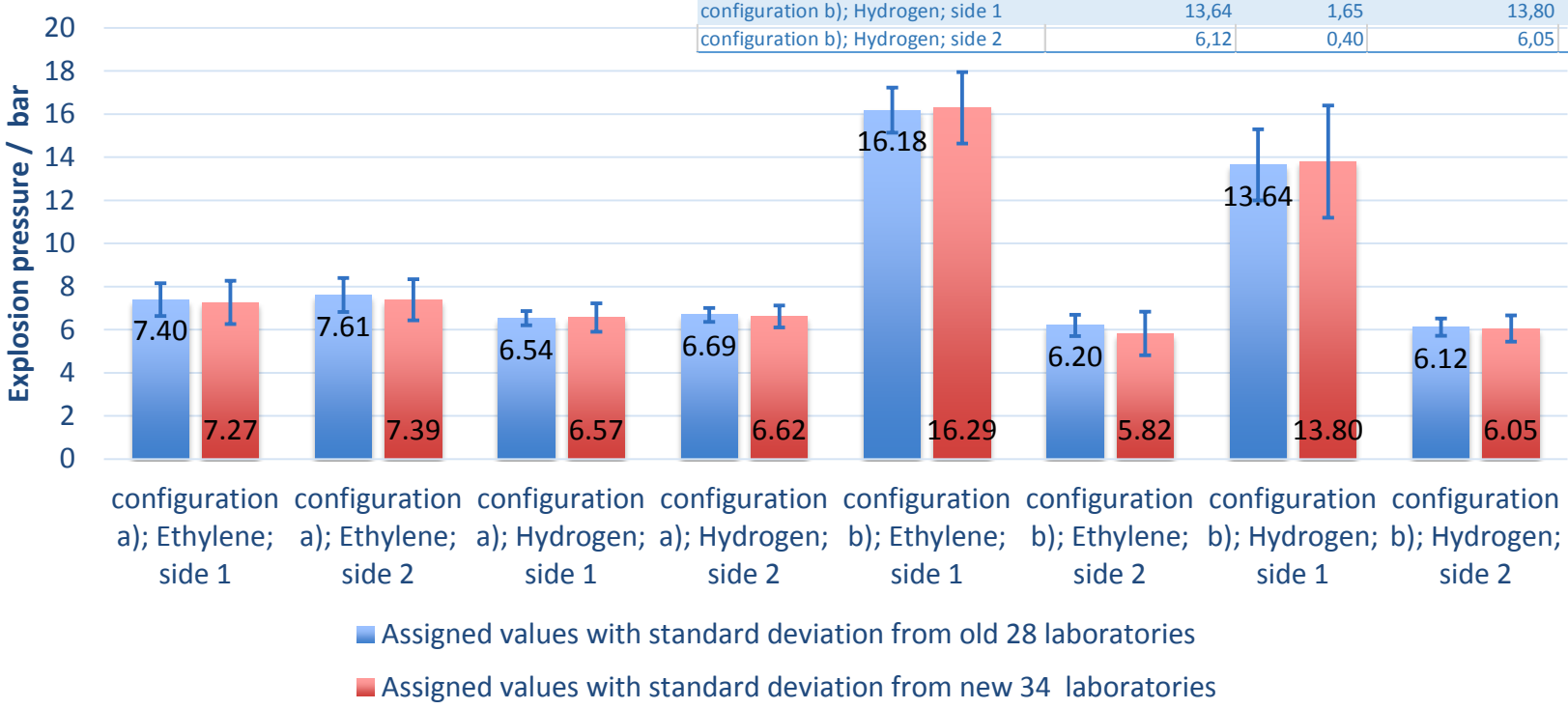
Configuration b); Ethylene; Side 1, at an ambient temperature of -40°C



Further analysis of the program results

Comparison of the results of the “old” and “new” participants

	Assigned value of 28 laboratories (old) / bar	Standard deviation / bar	Assigned value of 34 laboratories (new) / bar	Standard deviation / bar
configuration a); Ethylene; side 1	7,40	0,76	7,27	1,00
configuration a); Ethylene; side 2	7,61	0,79	7,39	0,95
configuration a); Hydrogen; side 1	6,54	0,33	6,57	0,66
configuration a); Hydrogen; side 2	6,69	0,32	6,62	0,51
configuration b); Ethylene; side 1	16,18	1,05	16,29	1,65
configuration b); Ethylene; side 2	6,20	0,49	5,82	1,01
configuration b); Hydrogen; side 1	13,64	1,65	13,80	2,60
configuration b); Hydrogen; side 2	6,12	0,40	6,05	0,61



PT Workshops 2018

The workshops took place from 11 to 14 June 2018 with a total of around 90 participants at PTB. The topics were associated with the current programs “Explosion Pressure – Test Round 2017” and “Pressurized Enclosure – Test Round 2017”. The structure of the workshops consisted, as usual, of a theory day and a practice day for each program.

Overall performance of the workshops “EP” and “PE”:

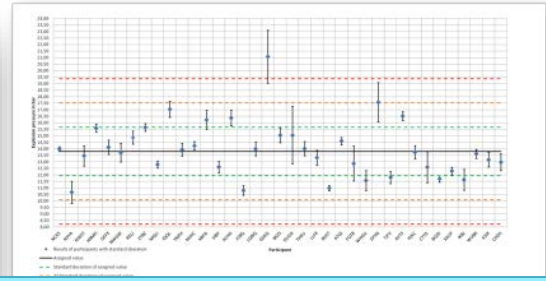
a) “EP” [8.8]
b) “PE” [8.1]
(10 = very good – 0 = very poor)

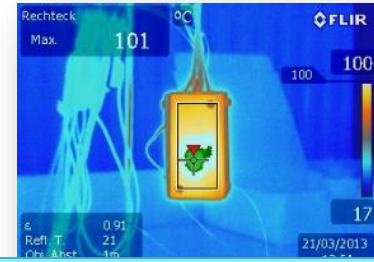
New PT programs for the cycle 2019/2020

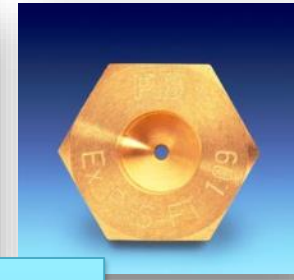
Suggestions for programs may be made by the Ex PTP Provider based on questionnaires circulated under the participating laboratories, by proposals of the ExTAG WG 10 “Proficiency Testing” or by other experts. The Ex PTP Provider will then take a decision on the programs to provide, taking those suggestions and any recommendations by ExTAG into account.

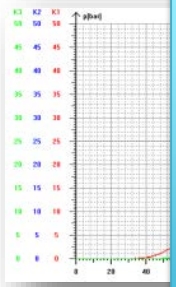
- **Summarized program proposals:**
  - Intrinsic safety protection according to IEC 60079-11
  - IP-test including test for resistance to impact according to IEC 60079-0
  - Dimensional control of Ex d enclosures according to IEC 60079-1
  - Type tests (explosion pressure, flame transmission) for small equipment according to IEC 60079-1

Would you like to know more?









http://www.ex-proficiency-testing.ptb.de/