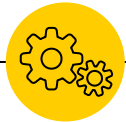


# Comparison Of Dose Calibrator Accuracy Using Standardized Sources As A Part Of Multicentre Clinical Assessment In Bulgaria

M. Dimcheva<sup>1</sup>, P. Trindev<sup>2</sup>

<sup>1</sup>Sofia Cancer Center, Department of Nuclear Medicine, Sofia, Bulgaria

<sup>2</sup>GAMMACHEK Ltd., Quality Control Expert, Sofia, Bulgaria





# Dose Calibrator: Components

- Ionisation chamber
- High voltage supply
- Electrometer & display
- Source holder
- Shield
- Calibration sources





## Recommended QC Tests

- Background response
- Linearity
- Constancy
- Precision
- Accuracy



## Introduction

The accuracy test aims to ensure that the activity values determined by the dose calibrator are traceable to national or international radioactivity standards within the indicated uncertainties. This study has two purposes: to provide national data on the accuracy of dose calibrators in use across the country and also provide an opportunity for the calibration of an individual calibrator to be corrected and brought within specification if initial verification shows that the readings are in error.



## Certified radioactivity standard sources

Co-57  
(122 keV)

Ba-133  
(356 keV)

Cs-137  
(662 keV)



## Sealed radioactive sources

Nuclide	Number	With certificate	Without certificate	Nominal activity
Cesium-137	15	7	2	6
Cobalt-57	1	1	0	0
Barium-133	4	4	0	0

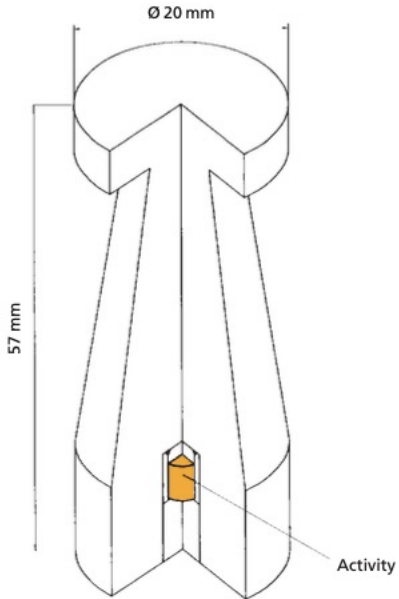


## Manufacturers of the dose calibrators used during comparisons

Manufacturer	No. of instruments
PTW – Freiburg GmbH	11
Capintec	1
Biodex	1
Comecer	1
Nuclear Medizintechnik	5
Picker	1
Veenstra Instruments	1



# Type of sealed radioactivity source



## ISO Classification

C.23323

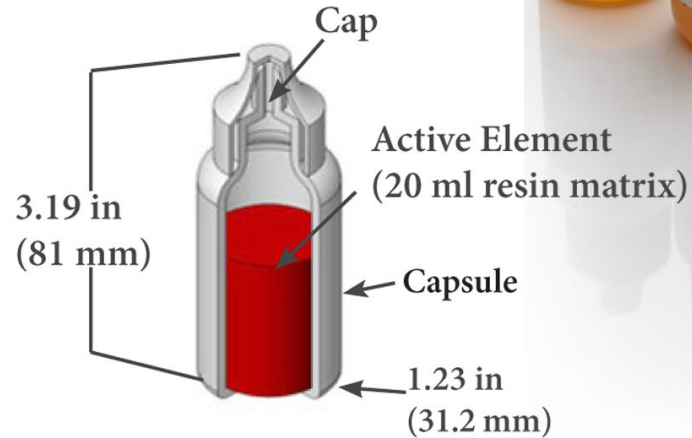
Drawing: VZ-322

## Tolerance

The maximum deviation of the delivered activity from the nominal value stated is -20% to +0%.

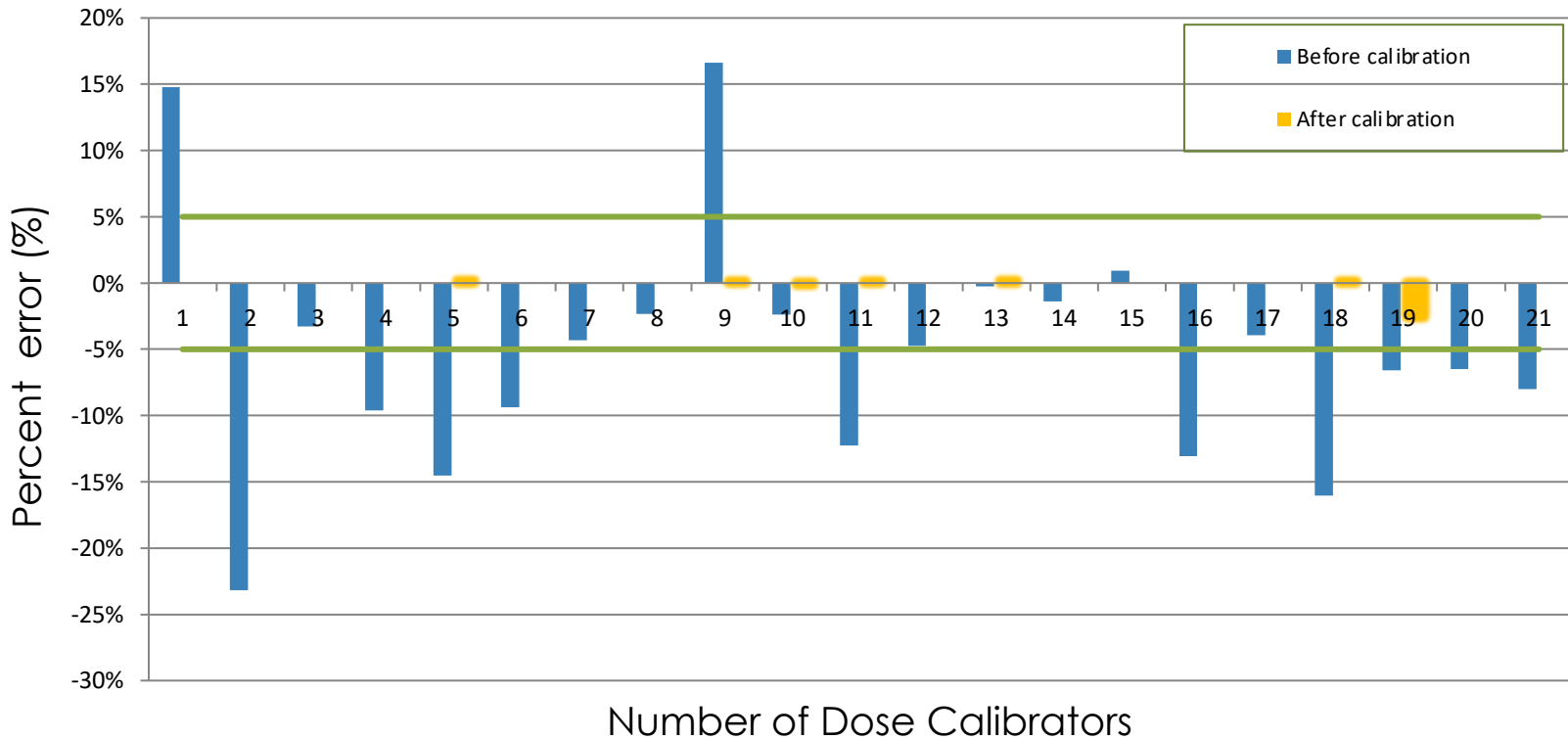
## License<sup>1</sup>

Nds 180/78

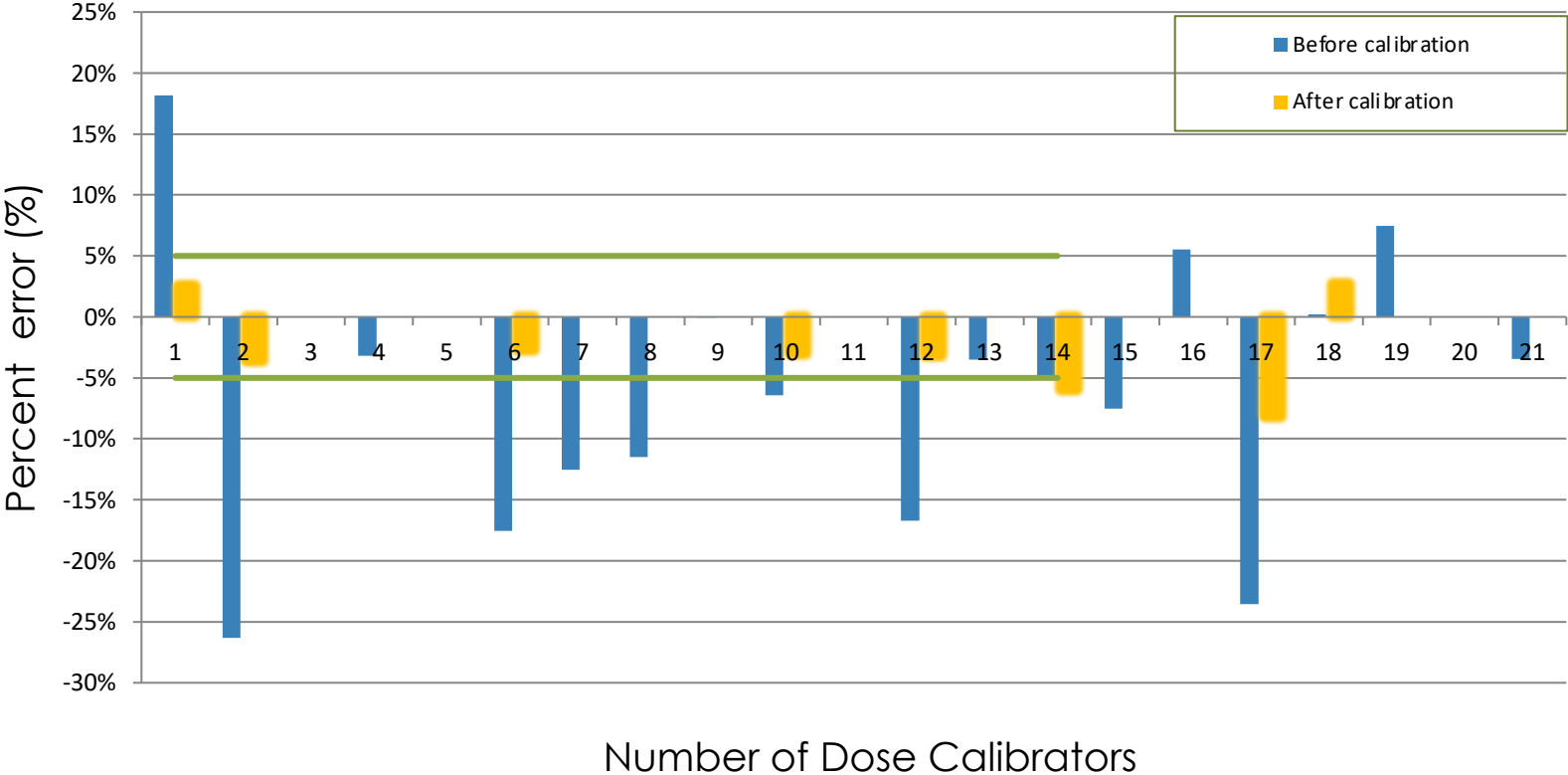




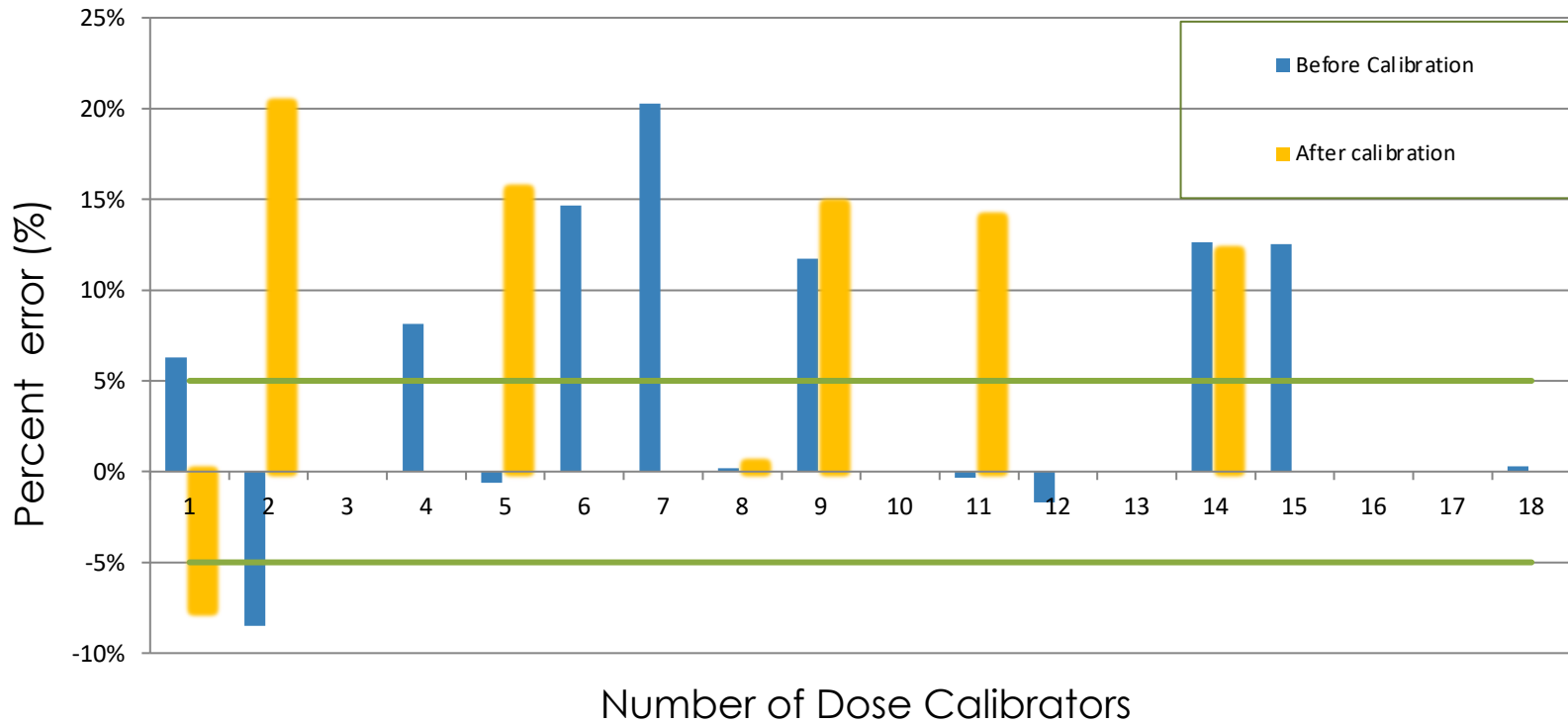
# Reference source of $^{137}\text{Cs}$ LB 165



# Reference source of $^{57}\text{Co}$ 1946-39-14



# Reference source of $^{133}\text{Ba}$ KF 951





## Conclusions

The reported deviations in measured activity for all radionuclides and dose calibrators are likely due to systematic miscalibration during the clinical operation of the dose calibrators. It is important to note that not all dose calibrators tested were clinically used to measure all radionuclides included in this study. This emphasises that dose calibrators must only be used for radionuclides for which the calibration has been checked.



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Thank you for your attention!