

New version of ANSI N42.13

Jeffrey T. Cessna

*Physics Laboratory, National Institute of Standards and Technology,
Gaithersburg, MD 20899-20899, USA*

ANSI

- American National Standards Institute
- Consensus standards
- Writing Groups
 - Trade, technical, and professional organizations; government agencies; and consumer groups
- ANSI N42 – Nuclear instruments
- ANSI N42.2 – Calibration of nuclear instruments

ANSI, cont.

- Audience
 - Technical users - guidance
 - Regulatory agencies – reference for regulatory guides
 - Instrument manufacturers – reference for writing instruction manuals

ANSI, cont.

- Content
 - Scope
 - Calibration
 - Method
 - Frequency
 - Types of standards to be used
 - Procedures
 - Making measurements
 - Assessing errors
 - Potential problems

ANSI N42.13

- Calibration and Usage of "Dose Calibrator" Ionization Chambers for the Assay of Radionuclides
- Writing Group
 - Jeffrey Cessna, Chair
 - Uve Beinlich, QSA
 - Brian Zimmerman, NIST
 - Joe DeCicco, NRC
 - Mary Anne Dell, Capintec
 - Jeff Norenberg, UNM
- rewrite of N42.13-1978, N42.13-1986

Other Guidance Documents

- NPL Good Practice Guide No. 93
 - Protocol for Establishing and Maintaining the Calibration of Medical Radionuclide Calibrators and their Quality Control (2006)
- IAEA Technical Reports Series No. 454
 - Quality Assurance for Radioactivity Measurement in Nuclear Medicine (2006)

Even more

- SCHRADER, H., Activity Measurements with Ionization Chambers, Monographie BIPM-4, Bureau international des poids et mesures, Sèvres (1997).
- INTERNATIONAL ELECTROTECHNICAL COMMISSION, Medical Electrical Equipment: Radionuclide Calibrators – Particular Methods for Describing Performance, IEC 61303(1994-10), IEC, Geneva (1994).
- INTERNATIONAL ELECTROTECHNICAL COMMISSION, Calibration and Usage of Ionization Chamber Systems for Assay of Radionuclides, IEC 61145(1992-05), IEC, Geneva (1992).

Scope

- Measurement of Activity
- Not, Measurement of Dose
- 1st draft (previous writing group chair)
 - Combined standard for Activity and Dose
 - Differing methodologies
- 2nd draft
 - Split
 - Created a need for a separate standard

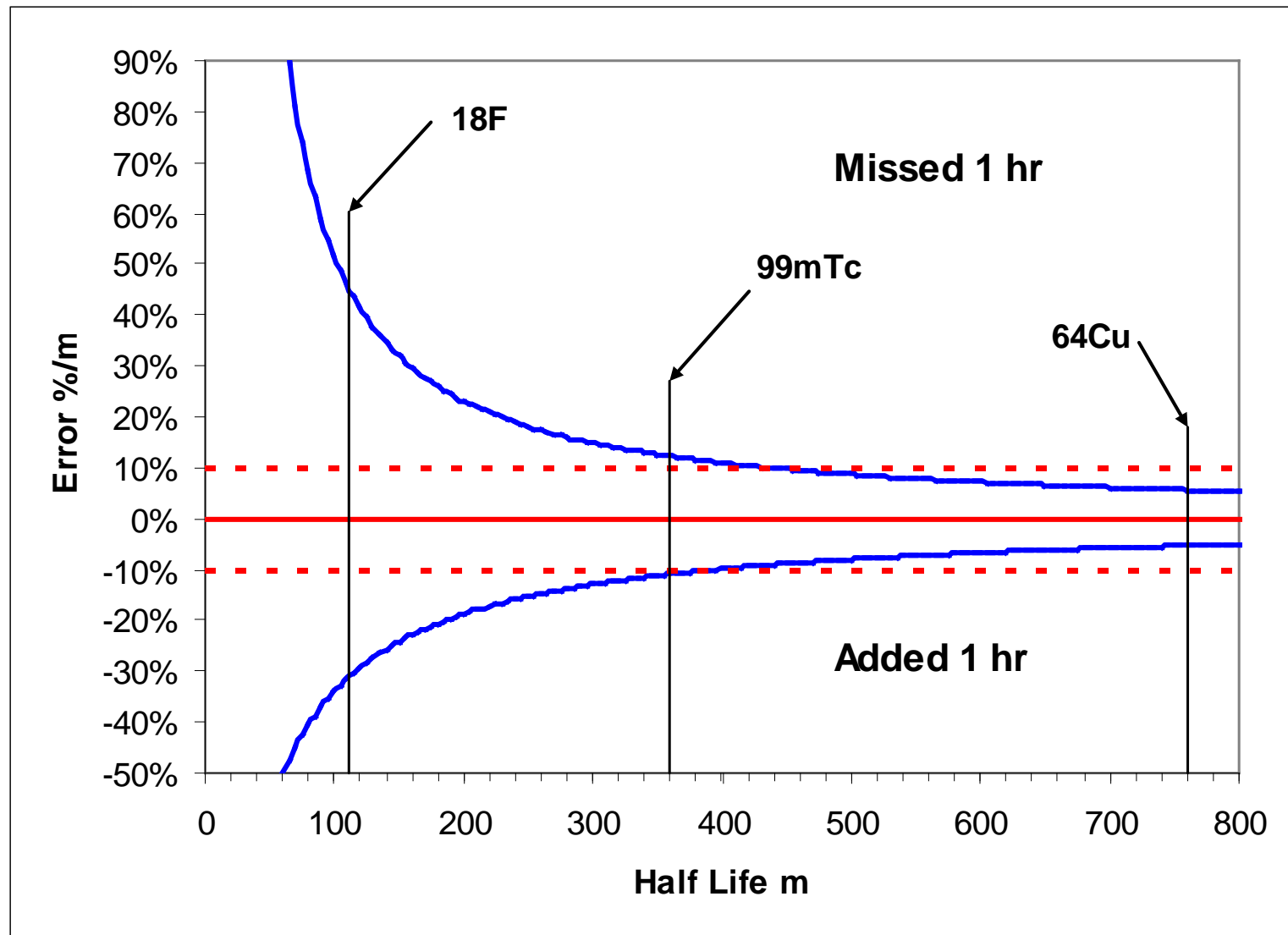
Recommendations

	Acceptance/ After Repair	Daily	Annually	Acceptance
Accuracy	✓		✓	10%
Reproducibility	✓		✓	5%
Linearity	✓		✓	5%
Zero	✓	✓		
High Voltage	✓	✓		
Background	✓	✓		
Clock	✓	✓		15 min
Check Source	✓	✓		5%

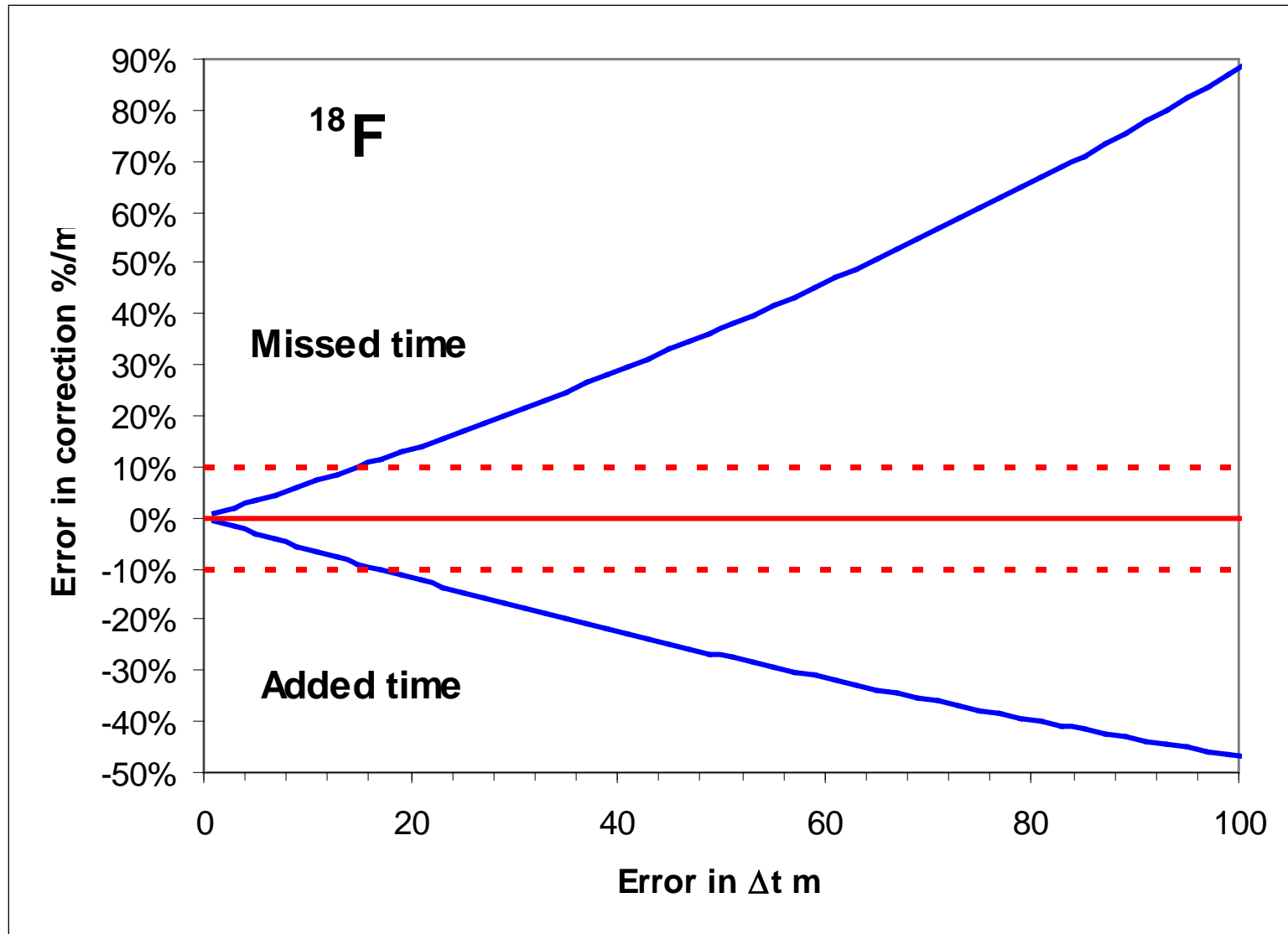
New

- Table of required tests, acceptable outcome
- Bibliography
 - Incl. Zimmerman Determination of Dial Settings
- Time Keeping
 - Synchronization of clocks to NMI
 - Recording of time zone
 - Examples of poor time keeping

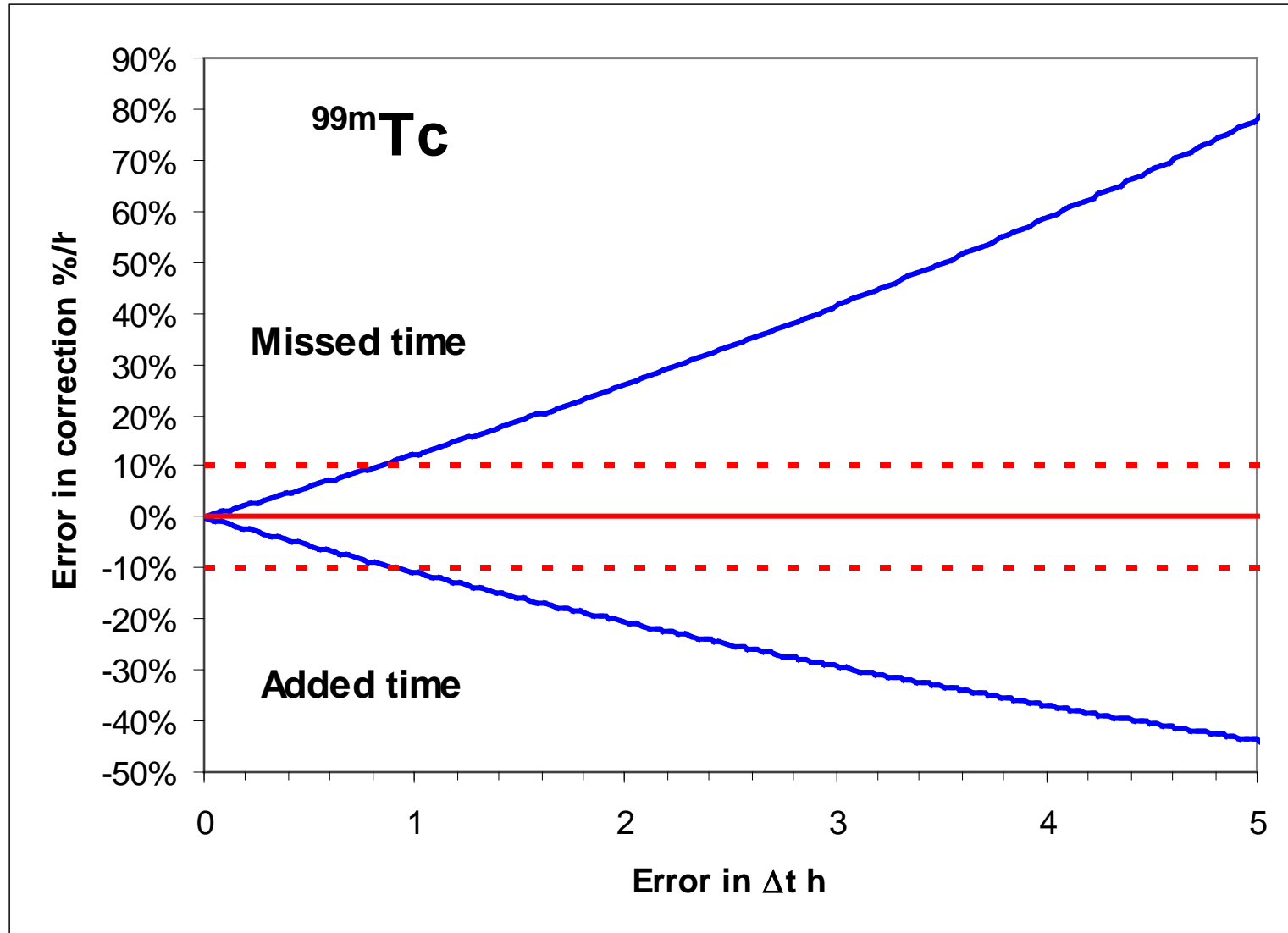
Effect of 1 hour on decay correction



Incorrect Δt for ^{18}F



Incorrect Δt for ^{99m}Tc



Discussion?