# Schedule of Accreditation

**issued by**

# United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

**4382**
**Accredited to**
**ISO/IEC 17025:2017**

## James Fisher Nuclear Limited

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**Unit 64, 65,**
**3rd Avenue,**
**Zone 2**
**Deeside Industrial Estate**
**Flintshire**
**CH5 2LA**

**Contact: Philip Pook**
**Tel: +44 (0)1244 283 892**
**E-Mail: Philip.Pook@jfnl.co.uk**
**Website: www.jfnl.co.uk**


**Calibration performed at the above address only**

Calibration and Measurement Capability (CMC)

| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty (*k* = 2) | Remarks |
|---|---|---|---|
| Surface contamination response.<br>Complying with statutory tests given in GPG14 including Tests before First Use | Alpha emitting nuclides<br>Americium-241<br>Thorium-230<br>Uranium-234/238<br>Plutonium-239 | 7.8 % | Calibration of portable surface contamination instruments using large area sources with surface emission rates traceable to national standards. |
| | Beta emitting nuclides<br>Chlorine-36<br>Carbon-14<br>Strontium-90 / Yttrium-90<br>Cobalt-60<br>Caesium-137<br>Technetium-99 | 6.8 % | |
| Air kerma rate | Americium-241<br>52 μGy.h$^{-1}$ to 616 μGy.h$^{-1}$ | 7.0 % | Calibration and testing of air kerma/air kerma rate monitors using air kerma rates traceable to national standards through a secondary standard dosemeter. |
| | Caesium-137<br>0.2 μGy.h$^{-1}$ to 1.8 Gy.h$^{-1}$ | 4.1 % | |
| | Cobalt-60<br>51 μGy.h$^{-1}$ to 2.6 mGy.h$^{-1}$ | 4.2 % | |
| Ambient dose equivalent<br>H*(10) | Americium-241<br>90 μSv.h$^{-1}$ to 1.1 mSv.h$^{-1}$ | 7.0 % | Calibration and testing of dose/dose rate monitors using air kerma rates traceable to national standards through a secondary standard dosemeter and using appropriate coefficients given in ISO Standards for H*(10). |
| | Caesium-137<br>0.2 μSv.h$^{-1}$ to 2.1 Sv.h$^{-1}$ | 4.1 % | |
| | Cobalt-60<br>59 μSv.h$^{-1}$ to 3.0 mSv.h$^{-1}$ | 4.2 % | |
| Personal dose equivalent<br>Hp(10) | Americium-241<br>98 μSv.h$^{-1}$ to 1.2 mSv.h$^{-1}$ | 7.0 % | Calibration and testing of electronic personal dosemeters using air kerma rates traceable to national standards through a secondary standard dosemeter, and using appropriate coefficients given in ISO Standards for Hp(10). Measurement uncertainties are dependent upon the exposure method used. The stated uncertainties are the best achievable using collimated sources. |
| | Caesium-137<br>0.2 μSv.h$^{-1}$ to 2.1 μSv.h$^{-1}$ | 4.1 % | |
| | Cobalt-60<br>59 μSv.h$^{-1}$ to 2.9 mSv.h$^{-1}$ | 4.2 % | |

**Calibration performed at main address only**

| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty ($k$ = 2) | Remarks |
|---|---|---|---|
| Alpha, beta and photon large area sources<br><br>Measurement of surface emission rates $s^{-1}$ | Alpha emitting nuclides<br>Americium-241<br>Thorium-230<br>Plutonium-239<br>Uranium-234/238<br><br>Beta emitting nuclides<br>Chlorine-36<br>Carbon-14<br>Strontium-90/Yttrium-90<br>Cobalt-60<br>Caesium-137<br>Technetium-99<br><br>Electron Capture nuclides<br>Iron-55 | 5.8 %<br><br>6.5 %<br><br>11.6 % | Measurement of surface emission rates from planar sources using a windowed gas-flow proportional counter, calibrated with extended reference sources of the same nuclide.<br><br>The measurement uncertainties are dependent upon the nuclide and surface emission rate. The stated values are the best achievable. |

END

## Appendix - Calibration and Measurement Capabilities

**Introduction**

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

**Calibration and Measurement Capabilities (CMCs)**

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest measurement uncertainty that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The measurement uncertainty is calculated according to the procedures given in the GUM and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published measurement uncertainty in certificates issued under its accreditation.

**Expression of CMCs - symbols and units**

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand.
Thus, for example, a measurement uncertainty of 1.5 % means $1.5 \times 0.01 \times q$, where $q$ is the quantity value.

The notation Q[a, b] stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$