The following describes the machine specifications that this procurement must meet

The system shall have the following capabilities/features:

1. For delivery and installation the system will need to pass through an opening 2000mm in width and 2130mm in height

2. Capable of performing 3D CT data acquisition and reconstruction from Regions of Interest (ROI) within the component cylindrical envelope positioned in a vertical orientation

3. Required to clearly resolve features of 0.01mm or less within a 3D CT data acquired from a 5mm diameter stainless steel tube, at least 260mm in length, that is located within its own 15mm diameter envelope positioned at an offset of 25mm from the center line of the cylinder in the upper region of the overall space envelope

4. Required to clearly resolve features of 0.01mm or less from within 3D CT data acquired from the 5mm diameter stainless steel tube at a brazed joint featuring a 72% Silver/28% Copper (CuSil) braze material

5. Be capable of acquiring 3D CT data from the offset 5mm diameter stainless steel tube where it interfaces with a domed feature, in the lower region of the overall space envelope, when the entire assembly is inclined approximately 7 degrees from the vertical. It shall be possible to clearly resolve features of 0.01mm or less from within the reconstructed CT volume of this interface

6. Be capable of performing high resolution direct radiography of a circular feature at the circumference of the 280mm diameter cylindrical envelope in both a vertical and horizontal orientation. At these positions the system shall be capable of resolving individual features of 0.5mm diameter, and clusters of 0.1mm diameter features within 0.25mm of mm spacing, through the equivalent of 30mm of aluminum

7. Be capable of displaying real-time (12.5 frames/second or faster) 2D radiographic images, without pixel binning of the X-ray detector

8. Be able to capture a CT data set comprising a minimum of 5655 projections captured through a full 360o rotation, each of a 2-frame average, 0.5ms exposure, 1800 x 1800 pixels and 16-bit greyscale in under 2.5 hours including reference image capture, image correction, X-ray source stabilisation and writing of information to any computer storage device

9. Be capable of reconstructing a CT data set comprising a minimum of 5655 projections of 1800 x 1800 pixels and 16-bit greyscale into a single 1800 x 1800 x 1800 voxel, 32-bit 3D CT Volume in under 15 minutes including set up time and writing of information to any computer storage device

10. Be supplied with a Volumetric CT Data Visualisation and Analysis software package

11. If the systems incorporate a vacuum system this shall be oil free

12. The system shall comply with the Ionising Radiation Regulations 2017 (IRR17), follow the AWE

Design of Radiographic Enclosures: Radiation Protection Principles and Guidance, Issue 4.0,

14/02/2023 Ref: AWE/MAN.SYS/6892, and have full UKCA certification in accordance with:

Supply of Machinery (Safety) Regulations 2008

Electrical Equipment (Safety) Regulations 2016

Electromagnetic Compatibility Regulations 2016

***EU Council Directive 2013/59/EURATOM*** OR UK Equivalent Regulation when it becomes available.

The size of the machine is also vital to the procurement. Space constraints - Available space must fit within an overall cylindrical space envelope of at least 280mm diameter and 535mm height.