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**Certificate of Radiation Safety for
Astrophysics, Inc. Baggage X-Ray Imaging Systems**

Belden Engineering certifies that the *Astrophysics Inc.* ("Astrophysics") Product Line meets United States Food and Drug Administration ("FDA"), cabinet X-ray machine performance standards, Title 21, Code of Federal Regulation ("CFR") Section 1020.40, Performance Standards for Cabinet X-Ray Systems. Astrophysics Inc. This Conventional Product Line includes:

**XIS-5335, 5335S, 5335SD, 5335M XIS-5878 XIS-6040, 6040M, 6040N, 6040NM XIS-6545,
6545DV, 6545DVS, 6545M, 6545VI XIS-7555R XIS-7858, 7858DVS XIS-100X, 100XD, 100XDV,
100XDX, 100XDV MD XIS-1080, 1080D, 1080S XIS-1210D XIS-1517, 1517 320kV, 1517DV 200kV,
1517DV 320kV XIS-1818 XIS-1819 200kV XIS-1818DV 200kV**

Belden Engineering has measured the external radiation emissions on the following Astrophysics X-ray machine models:

XIS-5335, XIS-6040, XIS-6545, XIS-7858, XIS-100X, XIS-100XDX, and the XIS-1517 DV 200KV

Radiation (dose-rate) levels did not exceed 0.1 millirem per hour (1 microsievert/hour) at any point five centimeters (5 cm) outside of all external surfaces of the machine. These measurements show that these machines comply with United States Food and Drug Administration (FDA), Center for Devices and Radiological Health (CDRH), cabinet X-ray machine performance standards (≤ 0.5 millirem/hour at 5 cm, which is equivalent to 5 microsievert/hour at 5 cm, from external surface) and can be located anywhere without limitations on access and that the machines are considered safe for the operators and for members of the public.

The X-ray measurements were made with a calibrated Fluke Model 451P-RYR survey meter. This meter uses a pressurized ion chamber with an approximately flat energy response from 50 KeV to 1,300 KeV. Measurements were made with radiation scatter-blocks, wrapped reams of 8.5" by 11" paper, centered in the X-ray beam to provide realistic measurement conditions.

The XIS-5335, XIS-6040, XIS-6545, XIS-7858, XIS-100X, XIS-100XDX, and XIS-1517DV 200KV are representative of Astrophysics' Conventional Product Line. The different Conventional Product Line X-ray models vary in the size of their inspection tunnel, the size of the conveyor/roller system, the geometry of the X-Ray generator and the number of x-ray tubes. But they share the same general design, radiation shielding, construction, components, application software, and safety features. Hence, they should have similar external radiation emission levels. Astrophysics x-ray machines undergo post-production Quality Control testing to insure compliance with applicable statutory safety regulations.

This survey was conducted because the United States' Government has no program that certifies the radiation safety of non-medical X-ray imaging systems.

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