WHAT IS CLAIMED IS:

1. A method of protecting material processing equipment, the method comprising~~;~~:

conveying a biomass material under an electron beam on a vibratory conveyor, ~~and~~

enclosing motor components of the vibratory conveyor in a radiation opaque equipment enclosure, and

providing a gap between the equipment enclosure and the vibratory conveyor sufficient to accommodate movement of components of the vibratory conveyor during use.~~.~~

~~2. The method of claim 1,~~ wherein the radiation opaque equipment enclosure is purged with gas and the method further comprises~~.~~

~~3. The method of claim 1 or 2, further comprising~~ exchanging the gas in the equipment enclosure at an exchange rate of less than once every 10 minutes.

4~~2~~. The method of ~~any one of the above~~ claims 1 wherein the gas is selected from the group consisting of air, oxygen reduced air, nitrogen, argon, helium, carbon dioxide, and mixtures thereof.

5~~3~~. The method of any one of the above claims, wherein the conveyor is disposed within a vault.

6~~4~~. The method of claim 5~~3~~, wherein the vault also contains irradiating equipment.

7~~5~~. The method of claim 1~~3~~, wherein the gas is provided from within the vault and the method further comprises filtering the gas prior to purging the equipment enclosure with the gas.

8~~6~~. The method of claim 7~~5~~, wherein the gas has been filtered to remove ozone.

9~~7~~. The method of any one of the above claims wherein the method further includes moving the equipment enclosure to access the motors components.

10~~8~~. The method of claim 9~~7~~, wherein the equipment enclosure is configured to be movable.

~~11~~9. The method of any one of the above claims wherein the equipment enclosure includes lead.

~~12~~10. The method of any one of the above claims wherein the exposure of the motor components to radiation is reduced by at least 10% as compared to the radiation exposure that would occur without the equipment enclosure.

~~13. The method of any of the above claims where the conveyor is a vibratory conveyor.~~

~~14. The method of any of the above claims further comprising providing a gap between the equipment enclosure and the vibratory conveyor to accommodate movement of components of the vibratory conveyor during use.~~

~~15~~11. A system ~~for protecting a motor and other motor components of a vibratory conveyor, the system~~ comprising:

an electron beam irradiating device;

a vibratory conveyor, positioned such that material conveyed on the conveyor is exposed to the electron beam, the conveyor having motor components mounted on a structure; ~~and~~

a substantially radiation opaque equipment enclosure configured to be positioned over the motor and having an open end that is dimensioned so as to provide a gap between the equipment enclosure and the structure when the equipment enclosure is in place; and

a conduit configured to flow a purging gas into the equipment enclosure; and

a source of purging gas in fluid communication with the conduit.

~~16~~12. The system of claim 11, wherein the gap is maintained by fixing the equipment enclosure relative to the conveyor using a stop, a groove, a spacer and/or a fastener.

~~17. The system of claim 15, further including a conduit configured for flowing a purging gas into the equipment enclosure.~~

~~18~~13. The system of any one of ~~the above~~ claims 11-12 further comprising equipment for moving the equipment enclosure into and out of position over the conveyor components.

~~19~~14. The system of any one of claims 11-13~~17~~, wherein the equipment is selected from wheels attached to the equipment enclosure, tracks for sliding the equipment enclosure, wheels disposed below the equipment enclosure (e.g., attached to the ground), sliders (e.g., slide rails), linear guides and combinations thereof.

~~20~~15. The method of any one of ~~the above~~ claims 1-10 wherein the exposure of the motor components to radiation is reduced by at least 20% as compared to the radiation exposure that would occur without the equipment enclosure.

~~21~~16. The method of any one of ~~the above~~ claims 1-10 and 15 wherein the exposure of the motor components to radiation is reduced by at least 30% as compared to the radiation exposure that would occur without the equipment enclosure.

~~22~~17. The method of any one of ~~the above~~ claims 1-10 and 15-16 wherein the exposure of the motor components to radiation is reduced by at least 50% as compared to the radiation exposure that would occur without the equipment enclosure.

~~23~~18. The method of any one of ~~the above~~ claims 1-10 and 15-17 wherein the exposure of the motor components to radiation is reduced by at least 70% as compared to the radiation exposure that would occur without the equipment enclosure.

~~24~~19. The method of any one of ~~the above~~ claims 1-10 and 15-18 wherein the exposure of the motor components to radiation is reduced by at least 90% as compared to the radiation exposure that would occur without the equipment enclosure.

~~25. The method of claim 2 where the gas comprises air.~~

~~26. A method of protecting material processing equipment, the method comprising;~~

~~conveying a biomass material under an electron beam on a conveyor, and enclosing components in a radiation opaque equipment enclosure.~~

~~27. The method of claim 26 where the components comprise the conveyor and the ancillary conveyor parts.~~