

Subject: Ames Blue Alert – X-ray Shutter Maintenance

Statement: This lesson learned involves an Ames Laboratory x-ray system. Prior to starting x-ray experiments checking the operability of safety interlocks and x-ray shutter systems will decrease the likelihood of an unplanned exposure incident.

Discussion: At the end of a sample run the shutter for an x-ray system at the Ames Laboratory did not close automatically as expected. The researcher followed the approved safety procedures and did not access the sample area when the shutter indication light remained on after the experiment timed out. The researcher stopped any further actions, and notified Environment, Safety, Health & Assurance. The system was inspected by the Radiation Safety Officer and a technician from Engineering Services. The shutter was closed externally with the manual toggle shutter switch. Further experiments were postponed and the x-ray system was locked out and tagged out until the system was repaired. The researcher received no exposure as a result of the incident. After disassembly, cleaning and reassemble all systems operated as designed. Upon further investigation it was discovered that the shutter mechanism had corrosion buildup on internal surfaces. The topic was examined by the ALARA Committee and the following suggestions/recommendations have been made:

1. Prior to an experiment, actuate the x-ray shutter to the open and closed positions taking note of the shutter indication lights and shutter movement.
2. Stop work if at anytime safety interlocks and shutter indication lights are not operating properly.
3. Do not leave the interlock bypass key in the x-ray system. It is not a key holder. The key should be administratively maintained by the x-ray system custodian.
4. Follow the manufacturers suggested maintenance schedule.
5. Follow the standard operating procedure for the x-ray system you are using.
6. Follow the requirements in the Ames Laboratory Radiation Safety Manual.
7. Contact your x-ray system manager with any questions and concerns.
8. Call the Radiation Safety Officer with any questions and concerns when they arise.

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