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Subject: Green Alert: Digital Cameras Reduce Personnel Exposures

Title: Green - **Digital Cameras Reduce Personnel Exposures**

Identifier: INEEL Lessons Learned #97362
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Executive Summary: The following Idaho National Engineering and Environmental Laboratory (INEEL) Lockheed Martin Idaho Technologies Green Lessons Learned is being issued to inform you that using digital cameras can reduce multiple entries and personnel exposure in highly contaminated areas.

Summary of Success Story: Digital cameras can be an effective tool in documenting conditions in contaminated work areas where maintenance must be performed but obstacles prevent a good view from the outside. Photographs taken by digital camera provide both an immediate and a permanent record of workers' observations. The small size and relatively simple operation allows the camera to be successfully operated by an individual wearing personal protective equipment (PPEs).

Discussion of Activities: Protective shielding and other obstacles in radiologically and chemically contaminated areas often prevent decision-makers' from "seeing" the problem. When a maintenance problem occurs, a radiological control technician and a craft worker don PPEs and enter the area to assess the situation. Although the entry may take no more than 15-30 minutes, it must be carefully planned, the necessary paperwork completed, and approvals obtained. Additional personnel must be on hand to assist with the entry. PPEs worn in contaminated areas must be disposed of as low-level waste.

After exiting the controlled area, personnel report their findings. If additional information is required, a second (or even third or fourth) entry may be required. Key information may be lost in the telling.

Conventional cameras can be used to document observations but have limitations. Cameras brought into contaminated areas must be sealed inside two polyethylene bags with holes cut for the lens and flash units. The bags make it difficult to develop pictures produced by instant cameras. Depending on the nature of the activity, there may not be enough time to develop conventional film. Video cameras are unwieldy and do not produce high-quality still photographs. In addition, videotapes are more difficult to transport, store, and view than still pictures.

Digital cameras provide a promising alternative. As with a conventional camera, the small size and simple operation allows the camera to be double bagged and successfully operated by an individual in PPEs. Photographs taken by digital camera can be downloaded without delay onto a computer, where they can be instantly viewed by decision-makers. The photographs can be

saved, catalogued, retrieved, and even electronically incorporated into the work package. The photographs can be used for future pre-job briefings, job planning, and engineering.

Many digital cameras have a voice recording feature. Rather than completing a written photographic log (which must be treated as contaminated and ultimately disposed of as low-level waste), the photographer can record the log orally, even while wearing a respirator. The log is downloaded with the photographs onto a computer where it can be saved and replayed each time the photograph is viewed.

High-end digital cameras are comparable to the best conventional cameras on the market but may be too expensive to risk using in highly contaminated environments. Inexpensive digital cameras, which are suitable for use in these areas, have some limitations: the photographs may not show as much detail, the depth of field may be limited, and moving parts may be blurred. Clearing the memory and recalibration may take up to 10 seconds, which prevents the photographer from taking a rapid sequence of pictures.

Recommended Actions: Digital cameras may be a cost-effective tool for use in highly contaminated areas. They are relatively easy to use and photographs can be immediately viewed and electronically stored. The use of digital cameras may reduce personnel exposures and increase decision-makers knowledge of conditions in contaminated areas.

Estimated Savings/Cost Avoidance: Reduction in personnel time, exposure risks, and waste generated and increased understanding of potential risks result in anticipated savings of \$1,000 (soft dollars) for each entry.

Priority Descriptor: Green/Good Work Practice Functional Category(s) (DOE): Human Factors, Human Resources, Information Technology, Maintenance, Occupational Safety and Health, Radiological Protection Functional Category(s) (User-Defined): Maintenance, Nuclear Safety, Occupational Safety and Health, Radiation Protection Originator: Lockheed Martin Idaho Technologies Company Idaho Chemical Processing Plant Contact: W. Rick Horne, (208) 526-5318; Craig Walker, (208) 526-1319 Name of Authorized Derivative Classifier: Dale Claflin, (208) 526-1199 Name of Reviewing Official: Dale Claflin, (208) 526-1199 Key Word(s): success, savings, camera, digital, contamination References: N/A.

Follow-up Action: Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report, please notify Terry Pierce at (208) 526-4288 (or by electronic mail at txp@inel.gov) or the INEEL Lessons Learned Program Office at (208) 526-1530 (e-mail at mae@inel.gov or limitl@inel.gov) of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is important and appreciated.