

24 Work Planning

Good work planning is the key to effective radiation protection and general safety. Health Physics can teach courses and write procedures, but proper work planning will make the best use of this knowledge, and, in the long term, reduce doses and create a safer working environment.

Do not think that work plans are only needed when doing difficult or high-dose work. Stop and think before beginning any work in radiation areas:

Identify the Hazards

Break down the job into steps and examine each step to determine possible hazards. Ask yourself these questions:

1. What work will the people be doing?
2. What other work is going on?
3. What systems are in the work area?
4. What hazards are to be expected?
5. Will the work itself create/change hazards?
6. What hazards will exist if conditions change?

Assess the Hazards

1. Use the correct instrument for assessing the hazard, i.e., gamma meters cannot measure beta fields.
2. Ensure that your instruments are functional, (i.e., perform pre-operational checks)
3. Perform regular surveys of the work area on an established routine (e.g., gamma surveys, O₂ monitoring, etc.).
4. Notify other workers of the survey results. Make sure that they understand the hazards.
5. Ensure that your surveys are accurate and complete. Signpost general conditions in a legible manner and record time, date, and name.

Control the Hazards

Hazards can be controlled or reduced in a number of ways; these are listed below in decreasing order of effectiveness:

1. Eliminate the hazard, e.g., de-energize the system before working on it.
2. Minimize the hazard, e.g., install shielding to lower gamma fields.
3. Install physical barriers, e.g., guardrail around openings.
4. Install warning devices, e.g., sign-posting, Area Alarming Gamma Monitors (AAGM), etc.
5. Minimize human error potential, i.e., use the right person for the right job.
6. Establish procedures and review them regularly.

Determine Dosimetry Required for Radiation Work

Dosimeter is chosen based on the radiation hazards that you anticipate and also on the nature of the work to be done. Some examples of dosimetry include:

1. extremity TLDs (beta sources)
2. neutron meter/scaler (if neutron dose is expected)
3. urine sample (work in tritium areas)
4. portable alarming dosimeter (dose limits or changing gamma fields)

Some other dosimetry considerations

1. Know the worker's Radiation Worker (RW) status. If you are not sure, DON'T let him/her start work. Contact the Health Physics Department.
2. Check for any dose check points before work commences.
3. Check Direct Reading Dosimeters (DRD) before, during, and after the job. Keep workers informed.
4. Find out if there are any dose limits for the job. You may find that a supervisor does not want his worker to exceed a certain limit.
5. Follow plant procedures; for example, update DRD cards and dose record sheets at the end of the job; forward dosimetry information forms to Health Physics lab; have workers give urine samples, etc.

Determine Protective Clothing/Equipment Required

When a hazard cannot be eliminated or reduced, then personnel may have to wear protective clothing or equipment to protect them. The following points should be considered before using protective equipment:

1. Check the equipment for defects, damage, etc.
2. Does it provide sufficient protection? For example, when handling corrosive chemicals, don't rely on safety glasses alone; a full face shield is also required.
3. Know any limitations or precautions regarding the equipment/clothing, e.g., an air-purifying respiratory shall not be worn with beard.
4. Use the equipment for the purpose it was designed for, e.g., don't use a safety belt for fall protection; it is a restraining device only.

Obtain Necessary Authorizations

Work Permit. All work in radiation areas must be done under a Work Permit (WP). Apply for a WP several hours before work starts.

Safety Work Plan (SWP). A safety work plan may be required when hazardous work is to be done. Follow plant procedures.

Work Plan. Study the work plan carefully and follow it step by step. Ensure that you and the workers understand what is required of them. If you don't understand the plan, or if you want to change the plan, contact the system engineer/work plan author.

Recording a Change in Configuration. Whenever you must change a system configuration (i.e., raise AAGM alarm set points, connect flexible ducting to ventilation system, etc.), apply for a work permit and have the change recorded in the appropriate place.