

ALARA Procedure

The ALARA concept is an excellent foundation for any radiation safety program; when practiced it allows for the lowest dose to be received by occupationally exposed personnel. The primary ALARA principles are use of time, distance, and shielding so as to minimize the radiation dose received by a worker. The ALARA Procedure is a formal review process to discuss details of a high risk job so that dose can be as low as achievable. This procedure is for jobs wherein the potential exists for exposure to an unshielded source (usually during source transfers). The items below list all the controls that should or can be utilized and will be considered in each task or step of the source transfer or any other high risk procedure.

1. Primary Shielding
2. Engineering controls
3. Training
4. Communication
5. Long reach handlers
6. Remote observation
7. Emergency conditions
8. Job task
9. Dose evaluation
10. Hold points
11. Verifications
12. Instrument Response check
13. Dosimetry
14. Documented pre job briefing
15. Mock up or dry run prior to source movement
16. Area radiation monitor and instruments for use

Additional Detail:

1. Primary shielding is typically lead or DU that is placed between the source and the device or transfer

shield exterior so as to minimize radiation levels at locations where personnel may be present.

2. Engineering controls are items such as temporary shielding, long reach tooling, alarming meters, and physical stops to prevent unwanted movement of the source.

3. Training shall consist of mock up or dry run, task authorization, engineering controls, Instrument response checks, hold points, communications, use of tooling, lessons learned and review of operating and emergency procedures.

4. Communications shall be discussed to address that each person involved in the transfer of sources shall have a clear understanding of each process in the procedure and limitations. **Use of pass-back communication required.** Understanding is communicated with all personnel that any perception of an unsafe condition is cause for any individual to voice a Stop command. Furthermore, understanding is communicated that all personnel have the opportunity to voice any questions, concerns, process improvements, etc.

5. Evaluate the need for long reach handlers.

6. Remote observation would discuss the use of bore scope, cameras or mirrors to keep dose as low as possible.

7. Evaluation and an emergency plan will be developed based on the type of transfer, location, room size, source size, type of transfer shield setup, etc.

8. Job task will be addressed in the pre job briefing and define who can do what and when.

9. Dose evaluation will be calculated for the various steps in the transfer procedure for whole body and extremities.

10. Hold points are places in the procedure where one person verifies that the preceding step has been completed and will give the thumbs up or repeat the steps until the process is complete. Use of pass-back communication required.

11. Verifications would be used after hold points to ensure that a step in the procedure has been completed successfully.

12. Evaluation of instrument response checks will be determined based on the transfer procedure e.g.: response test after securing a meter for proper operation if the instrument has an alarm, test the alarm function etc.

13. Dosimetry shall be evaluated for the type of transfer to be performed. Also, relocation of dosimetry may be required: the dosimeter may be worn on the shirt pocket, shirt collar, lanyard, belt, etc. so that the highest potential dose rate is recorded.

14. Pre job briefing will be conducted prior to the start of any transfer. The items discussed will be in the ALARA Document and will address all concerns prior to starting the job with the source transfer procedure.

15. A mock-up with all involved in the work or if a mock-up is not possible, then a dry run will be performed prior to moving any sources.

16. Area Radiation monitor will be evaluated: where to locate, how to response test, and actions to take when responding to an alarm.

The above items will be used to develop a Pre job discussion so a formal instruction can be provided prior to starting the job. The attachment "ALARA Document" will have a check off sheet after the final review of the Source Transfer Procedure.