

CHECKLIST FOR APPROVAL OF LAYOUT PLAN FOR RADIOGRAPHY ENCLOSURE

1. Location of the Radiography Enclosure proposed to be constructed:

2. The Land at which Radiography Enclosure is proposed belongs to :
Contract Awarding Party Self-Owned Leased
3. Layout plans submitted for approval of enclosure to use: Radioisotope and/or X-ray
 - (a) Radioisotope and its Maximum Activity:

 - (b) Energy of X-ray/Accelerator (in kV or MV) and its Output at 1m distance:

(Layout plan need to be prepared for source with maximum energy with workload of 30 hr/wk)

4. The following layout drawings to scale must be enclosed along with the application:
 - (a) Copy of Installation Site drawing (to scale 1:200) attached Yes No
 - (b) Copy of Radiography Room drawing (to scale 1:50) attached Yes No
 - (c) Copy of Cross-Sectional Room drawing (to scale 1:50) attached Yes No

5. The drawings must indicate the followings:

In the Installation Site layout drawings

- (a) Radiography Enclosure and the associated facilities indicated Yes No
- (b) Occupancies all around the Radiography Enclosure clearly indicated Yes No
- (c) Facilities in the vicinity of Radiography Enclosure clearly indicated Yes No

In the Radiography Room layout drawings

- (a) Location of the Source is clearly indicated Yes No
- (b) Source type & maximum activity/kV/MV etc. clearly mentioned Yes No
- (c) Occupancies all around the Radiography Room clearly indicated Yes No
- (d) Distances of all the walls from source position clearly indicated Yes No
- (e) Wall Materials and the density of the walls are clearly indicated Yes No
- (f) Dimensions of all the walls are clearly indicated Yes No
- (g) Control room location is shown in the drawing Yes No
- (h) Pit constructed in the enclosure (if any) is shown in the drawing Yes No

In the Cross-sectional(elevation) Room layout drawings

- | | | |
|-----------------------------------------------------------------------------|------------------------------|-----------------------------|
| (a) Location of the Source is clearly indicated | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (c) Occupancies above the ceiling is clearly indicated | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (b) Distances of all the walls including ceiling from source indicated | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (c) Wall Materials and density of the walls including ceiling are indicated | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (d) Dimensions of all the walls including ceiling are clearly indicated | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (e) Conduit for drive/control cable to operate radiography device provided | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| (f) Exhaust/Ventilation (if any) is shown in the drawing | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

Undertaking:

I hereby undertake that a quality assurance programme shall be formulated to maintain the quality during construction with respect to material, density and thickness as per the approved plan of proposed radiation facility received from AERB.

SEAL

Signature of the Applicant

Place :

Name :

Date:

Designation:

I hereby undertake that the plan submitted herewith are **reviewed** and **signed** by me, as they are satisfactory from radiation safety stand point. I have also scrutinised the application form and information provided in it are correct to best of my knowledge. **Further, I understand that if the layout plan is not in accordance with this checklist it is liable for rejection.**

Contact details of RSO/Shielding Expert:

(Signature of RSO/Shielding Expert)

Phone/Mobile No.:

Name:

e-mail id:

Address:

SPECIFICATIONS FOR LAYOUT OF ENCLOSURE FOR INDUSTRIAL RADIOGRAPHY

To establish an enclosure for industrial radiography, the user institution must go through the Regulatory requirements as mentioned in the Atomic Energy (Radiation Protection) Rules, 2004 and AERB Safety Code (AERB/RF-IR/SC-1 (Rev.1)). No regulatory clearance is issued for establishing enclosure for industrial radiography by AERB, unless the user complies with the regulatory requirements, specified in these documents. The first step to establish an enclosure for industrial radiography is to submit the layout plan of the radiation installation and get it approved from AERB from radiation safety standpoint. It is advisable to take services of experienced Radiological Safety Officer/ Radiation Shielding Expert and Architects to prepare the layout plan of the enclosure for industrial radiography. The **radiography room layout plans (to scale 1: 50)** and the **site layout plan (to scale 1: 200)** must be prepared and submitted through eLORA along with the filled in checklist **AERB/RSD/IR/PLAN** for approval.

- A. PLAN APPROVAL:** It is recommended to prepare the layout drawings (to the scale), in line with the typical layouts prepared by this Division may please be referred. The typical layouts are prepared based on the workload (30 hrs/week, normally used for the source having maximum energy and its maximum activity) and for full occupancies of public around the installation from radiation safety standpoint. The typical layouts are advantageous, as the enclosure may not need alterations in future, in case the occupancy around the installation changes. Though it is not mandatory to adopt the typical layout drawings prepared by this Division, it may be noted that **more time may be required by AERB for issuance of approval** due to involvement of further calculations.
- B. SITE SELECTION:** The location proposed for construction of radiography enclosure should be in industrial area. The location of the radiography enclosure should be so chosen that it is away from unconnected facilities. **It may be noted that it is essential to show the structures or facilities (occupancies) all around the radiography enclosure at least up to 20 metres**, including that above the ceiling and below the floor, if applicable, in the layout drawings without which it is difficult to make assessment of the submitted plan.
- C. CONSTRUCTION MATERIAL:** The construction material to be used for radiography enclosure should be concrete of density 2.35 gm/cc. However, where structural requirements so demand, RCC may be used. In case hematite concrete is used, the thicknesses may be reduced in inverse proportion to the ratio of the densities, as a thumb rule. If job entry door is provided, thickness of the job entry door should be equivalent to the thickness of wall in which door provided.
- D. CONDUIT:** A conduit of 5 cm diameter may be provided in the wall as shown in the typical drawings to enable driving cables of gamma radiography device or control cables of X-ray device/accelerator to pass through from the control console to the exposure room. The conduit should be fixed in the specified wall at an angle between 20° to 45° to the horizontal. The lower end of the conduit should be located in the room at a height between 15 cm to 20 cm from the inside finished floor level.
- E. DOOR INTERLOCK AND ZONE MONITOR:** In case of X-ray units/accelerators, personnel entry door as well as job entry door should be so interlinked to the control unit by electrical interlocks that the unit cannot be operated when the door is open. Appropriate zone monitor should be installed at suitable location (as shown in the typical lay out) in the radiography enclosure with audio visual alarm so as to indicate that radiation is On or OFF.
- G. WARNING LIGHTS:** Red warning light should be provided above the personnel entry as well as job entry door and wherever feasible, to indicate the radiation source is in the 'ON' position or 'OFF' position. In case of open top radiography enclosure, warning lights should also be provided on four corners of the enclosure. In case of X-ray units/accelerators, it should be ensured that all the warning lights are interlinked to the control console so that they glow when the source is in 'ON' position.
- F. VENTILLATION:** Ventilation arrangements, if any, should be such a way that the lower end of the openings should be located at a minimum height of 250 cm from the floor level outside and should further be covered with a baffle the length of its vertical portion should be such that 30-cm wide overlap is available all around the openings. In case air-conditioning is to be provided in the radiography enclosure, conduits, if any, of minimum diameter consistent with the requirement and making an angle between 20° to 45° with the horizontal should be provided. The opening of these conduits in the exposure room should be at a height about 1.5m from the floor of exposure room. In the case of accelerator installations special ventilation arrangements may be required.
- H. CONSTRUCTION RESTRAINTS:** It may be ensured that before starting construction work that the maze/labyrinth provided in the drawing is adequate for the movement of the components for radiography with or without crates. In case of open top radiography enclosure, it should be ensured that adequate cordoning facilities available for sky shine radiation during operation.
- I. STARTING CONSTRUCTION WORK:** **No construction work should be undertaken by the company unless prior approval of AERB for the specific layout of the installation has duly been obtained by the institution.**