

# Ionizing Radiation Safety

Ionizing radiation safety is a critical component of ensuring a safe working environment, especially when specialized equipment or processes that emit ionizing radiation are involved. This section outlines the responsibilities, control measures, and procedures designed to protect all personnel in accordance with client requirements and the NCC T&D HSE management system.

## Definitions

### Ionizing Radiation:

Radiation with sufficient energy to remove tightly bound electrons from atoms or molecules, creating ions. Common types include X-rays, gamma rays, and particulate radiation such as alpha and beta particles.

### Radiation Dose:

The amount of ionizing radiation absorbed by an object or person, measured in units such as sieverts (Sv) or rems. It quantifies the potential for biological effects.

### Dosimeter:

A personal monitoring device used to measure and record the cumulative exposure to ionizing radiation, ensuring individual doses remain within safe limits.

### Radiation Shielding:

Materials (e.g., lead, concrete) used to block or attenuate ionizing radiation, reducing exposure to personnel and sensitive equipment.

### Contamination:

The unintended presence of radioactive substances in an environment, which can lead to exposure if not controlled or removed promptly.

## NCC T&D Project Leaders Key Responsibilities

Project Leaders must ensure that:

### Radiation Safety Planning:

Develop and implement a comprehensive radiation safety plan tailored to specific project needs.

### Risk Assessment:

Identify areas and operations where ionizing radiation is present and evaluate potential exposure risks.

### Monitoring Implementation:

Establish and maintain effective radiation monitoring systems that provide real-time measurements of exposure levels.

### Training and Competency:

Ensure that all personnel working in or near radiation zones receive specialized training on safe work practices and emergency procedures.

### Documentation:

Keep detailed records of radiation surveys, equipment calibration, maintenance activities, and personnel training.

## Ionizing Radiation Control Measures

NCC T&D implements a range of measures to control and minimize exposure to ionizing radiation:

- Engineering Controls:
  - Install proper shielding and containment barriers in areas where radiation sources are used.
  - Utilize remote handling techniques and automation to reduce direct exposure.

- **Administrative Controls:**
  - Limit access to areas with radiation hazards through controlled entry protocols.
  - Establish clear work procedures that include exposure time limits and scheduled breaks.
- **Personal Protective Equipment (PPE):**
  - Provide specialized PPE such as lead aprons, thyroid shields, and dosimeters to monitor individual exposure.
  - Ensure proper use and regular maintenance of all PPE.
- **Radiation Monitoring and Surveillance:**
  - Use calibrated detectors and continuous monitoring devices to assess radiation levels.
  - Implement regular inspection and maintenance schedules for all monitoring equipment.
- **Signage and Barriers:**
  - Clearly mark areas where ionizing radiation is present with appropriate warning signs and physical barriers.

### **Worker Responsibilities**

Workers must:

- **Adhere to Protocols:**

Follow established radiation safety procedures and always use the provided PPE.

- **Monitor Personal Exposure:**

Wear dosimeters consistently and report any unusual readings to supervisors immediately.

- **Participate in Training:**

Attend all radiation safety training sessions and refresher courses to stay updated on best practices.

- **Report Issues:**

Promptly notify their supervisor or the HSE Department of any incidents or concerns related to ionizing radiation.

### **Additional Considerations for NCC T&D Projects**

Given the specialized nature of operations involving ionizing radiation, additional measures include:

- **Emergency Preparedness:**

Develop and communicate clear emergency response procedures specific to radiation incidents, ensuring that rescue and decontamination equipment is readily accessible.

- **Regular Reviews:**

Conduct periodic reviews and audits of radiation safety procedures to ensure compliance with the NCC T&D HSE management system and client requirements.

- **Continuous Improvement:**

Utilize incident reports and monitoring data to continuously refine safety measures and update training programs.

### **Key Takeaways**

- **Proactive Planning:**

Establish robust radiation safety plans and conduct thorough risk assessments.

- **Layered Controls:**

Implement a combination of engineering, administrative, and PPE measures to effectively manage radiation exposure.

- **Vigilant Monitoring:**

Ensure continuous monitoring and prompt reporting of any deviations in radiation levels.

- **Training and Communication:**

Emphasize specialized training and clear communication across all levels of staff.

- Documentation:

Keep detailed records to support ongoing safety and compliance efforts.

For further details or expert guidance, please refer to NCC T&D's relevant IMS procedures or consult our HSE Department.

