

**Regulatory Inspection  
on  
Nuclear Security Aspects  
of  
Civilian Nuclear Power Plants/Projects**



*Fredric Lall*  
Atomic Energy Regulatory Board, India

# Outline

---

- *Review of Nuclear Security Aspects*
- *Nuclear Security Requirements for Nuclear Power Plants & Projects*
- *Committees to review Security Aspects*
- *Regulatory Inspection*
- *Regulatory Inspections - Field Checks*
- *Regulatory Inspections – Document Verification*
- *Regulatory Inspection – Interview and Exit Meeting*
- *Regulatory Inspection - Reports*



# Review of Nuclear Security Aspects

- Atomic Energy Regulatory Board (AERB) of India reviews the Nuclear Security Aspects of Civilian Nuclear Power Plants/ Projects (NPPs), Radiation facilities, Transport of radioactive materials.
- AERB has Prepared documents:
  - Nuclear security requirements for NPPs
  - Guide lines for Reporting of Nuclear security events
  - Checklist for Regulatory Inspection of Nuclear power plants (NPPs)
  - Checklist for Regulatory Inspection of Nuclear Power Projects
  - Procedure for identification of Vital Areas
  - Security of radioactive sources in radiation facilities
  - Security of Radioactive material during Transport
  - Other documents under preparations
    - Security requirements for Heavy Water Plants
    - Security requirements for Nuclear Fuel Processing Facilities



# Nuclear Security Requirements for Plants & Projects

- Main Plant Boundary (MPB)
  - Watch Towers,
  - Patrol able Road,
  - Access control for Personnel, Material & Vehicles
  - Detection
  - Delay elements
  - Radiation monitors
- Operating Island
  - Isolation Zone with detectors
  - Access control for personnel, Vehicle and Materials
  - No Parking
  - Unloading of consumables from outside
  - Location for storing , handling & disposal of Hazardous material
- Distance between MPB & OI
- Central alarm station/Alternate central alarm station
- Distress alarms systems



# Nuclear Security Requirements for Plants & Projects

- Vital Areas & its requirements
- New Fuel Storage Areas
- Communication systems
- Power supplies
- Configuration controls
- Security Organisations
- Maintenance of PPS
- Modification / Up gradation of PPS
- Safety Security Interface
- Security Event Reporting
- Security Requirements for operating plants due to construction of new projects
- SOPs & Contingency Plans
- Quality assurance & Audits
- Training, Retraining & licensing
- Regulatory Inspection
- Documents



# Committees to review Security Aspects

- AERB has three tiers of review on Nuclear security aspects:
  - First Tier Review:
    - Committee for Reviewing Security aspects of Nuclear Facility (CRSANF)
    - Committee for review of Nuclear Security aspects of radiation facilities and for transport of Radioactive Materials
    - Advisory Committee on Security (ACS)- Advises on all nuclear security aspects
  - Second Tier Review
    - Safety Security Interface maintained at AERB level by review of reports of first tier by Safety Review Committee for Operating Plants (SARCOP) for Plants and respective Advisory Committee for Project Safety Review (ACPSR) for Projects, Safety Review Committee for Application of Radiation (SARCAR) for Radioactive Material.
  - Third Tier Review
    - Atomic Energy Regulatory Board



# Regulatory Inspection (RI)

- Basic Philosophy of nuclear Security RI same as safety RI of NPPs
- Planned/ Unplanned/Surprise Inspections
- Once in a year for Operating Plants
- For Projects depending on the stage of the project
- Approval of yearly Inspection schedule for plants
- Authorisation of Team leader/ Lead Inspector/Inspectors
- Member of the Inspection Team trained and experienced in the nuclear security aspects
- Inspection team members from Committee for Reviewing Security aspects of Nuclear Facility



# Regulatory Inspections (contd..)

- Intimation to Site for Planned Inspection
- Approximately 4 members in Inspection team
- Inspection for 2-3 days depending upon number of Operating Islands to be inspected.
- Inspections based on
  - Checklist for RI, AERB documents
  - Recommendations made by AERB
  - Follow-up of previous RI
  - Security Events reported earlier
  - Modifications/ Upgradation
- Introduction meeting
  - Only those connected with Nuclear security aspects
  - Briefing by Team leader
  - Presentation by site on present physical protection systems & status of previous RI observations
  - Plan for the Inspection





# Regulatory Inspections - Field Checks

- Inspections : Field checks, Documents verification and interviews/ competency checks
- Field checks:
  - Checks at different layers; Main Plant Boundary (MPB), Operating Island (OI) and Vital Area (VA) /Inner Area (IA) for:
    - Detection
    - Delays
    - Assessment
    - Access control for personnel, Vehicle and Materials
    - Functioning of various Gadgets
    - Power supplies
    - Communication
    - Alarms
    - Central Alarm Station/Alternate Alarm Station
    - Illumination
    - Water body

# Regulatory Inspections - Field Checks (contd..)

- Impact of new projects under construction near operating plants- by operating plant authorities
  - Segregation between project and operating plant
  - Access control for construction personnel, vehicle and materials to project
  - Location of Construction labour camp
  - Location of contractors work shop



# Regulatory Inspections - Field Checks (contd..)

- Nuclear Security requirements for different stages of project- by Project Authorities
  - Siting
  - Excavation
  - First pour of concrete
  - Erection of Major Equipment
  - Identification of critical area during different stages of the projects and provision for monitoring and control
  - Commissioning of PPS for New Fuel storage Building before arrival of fuel
  - Commissioning of all PPS before Initial Fuel Loading
  - Segregation of first unit for which IFL is to be done from the other units under construction or commissioning.
  - Requirements for operations



# Regulatory Inspections – Document Verification

- List of Vital Areas/ Inner Areas
- Procedures for :
  - Access controls of personnel- Visitors & Contractors
  - Vehicle & Material Movements
- Surveillance & Audit (Internal & external)
- Maintenance of PPS gadgets
- Standard Operating Procedures
- Reporting and Evaluation
- Contingency plans
- Records of Exercise, deficiencies and corrective actions
- Modifications & Up-gradation of PPS



# Regulatory Inspection - Document Verification (contd..)

- Non availability of gadgets and alternate measures
- Station & Site Security committees constitution orders and their minutes of meeting along with records of follow-up actions
- Interfaces:
  - Safety and Security
  - Plant Management and Security organisation
  - Site security organisation with external agencies
- Training syllabus and its records
- Configuration Control
- Internal Audit Records
- Security Organization



# Regulatory Inspection – Interview and Exit Meeting

- Interviews/ competency checks:
  - Plant Management
  - Central Alarm Station (CAS) operators
  - Main Guard House (MGH) Security Personnel
  - Operational & Maintenance staff
- Exit Meeting
  - Briefing of Observations & Deficiencies
  - Immediate corrective actions



# Regulatory Inspection - Reports

- RI reports
  - Issued within one week
  - Maintaining confidentiality
  - Stress on important & repeat observation
  - Response of RI Reports and Follow up
- Review in security committees;
  - Report along with responses in first tier- CRSANF
  - Recommendations of first tier in second tier
- Review reports considered while granting clearances for various stages.
- Maintaining Database for follow-up of recommendations



---

Thank you for your Kind attention

