



Pakistan Nuclear Regulatory Authority

Presentation 5.3

Management of Training Programs at PNRA

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Regional Meeting on the

Management of Training Systems for Nuclear and Radiological
Safety

6-10 November 2023, Philippines



Outline

- **Formal training schemes (initial and specialized) for different job positions in PNRA**
- **Formal training requirements identified as pre-requisites for various job positions at PNRA**
- **Updates in content of training and refresher training**



Training Schemes (Initial and Specialized) for different Job Positions



Competence Needs Assessment

- PNRA carried out Competence Needs Assessment of its employees in **2005, 2011. It has been repeated recently.**
- **Around fifty training courses were identified** in core regulatory competencies, during these TNA studies.



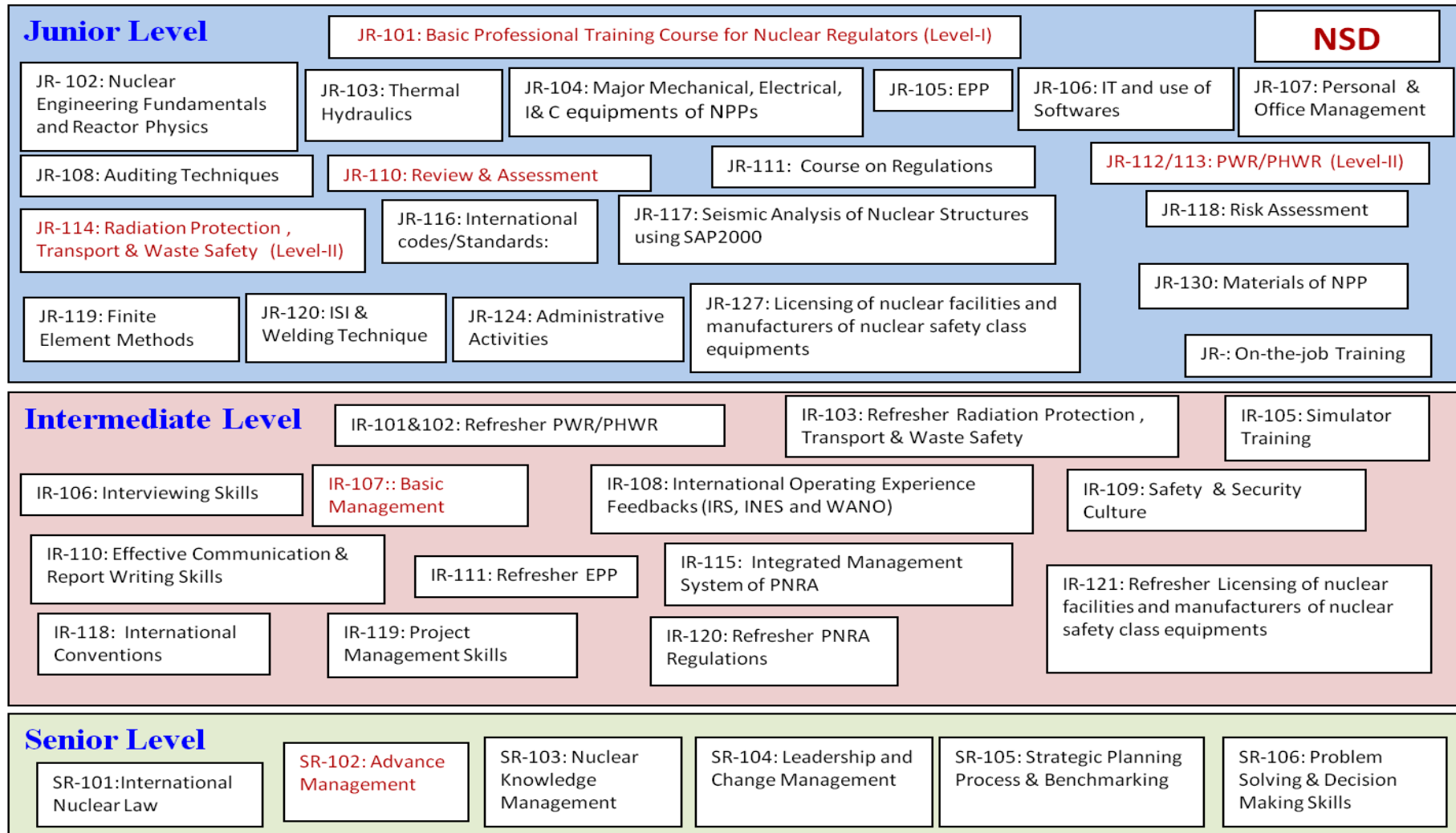
Directorate of Nuclear Safety (NSD)

NSD is mainly responsible for licensing/ authorization of

- nuclear installations (NPPs)
- manufacturer of nuclear safety class equipment activities and
- Designer, service providers (NDT)
- Establishing and maintaining regulatory framework for regulating the above areas
- Review and assessment of licensees' submissions
- Inspections and enforcement of manufacturers of nuclear safety class equipment



Training Program for NSD





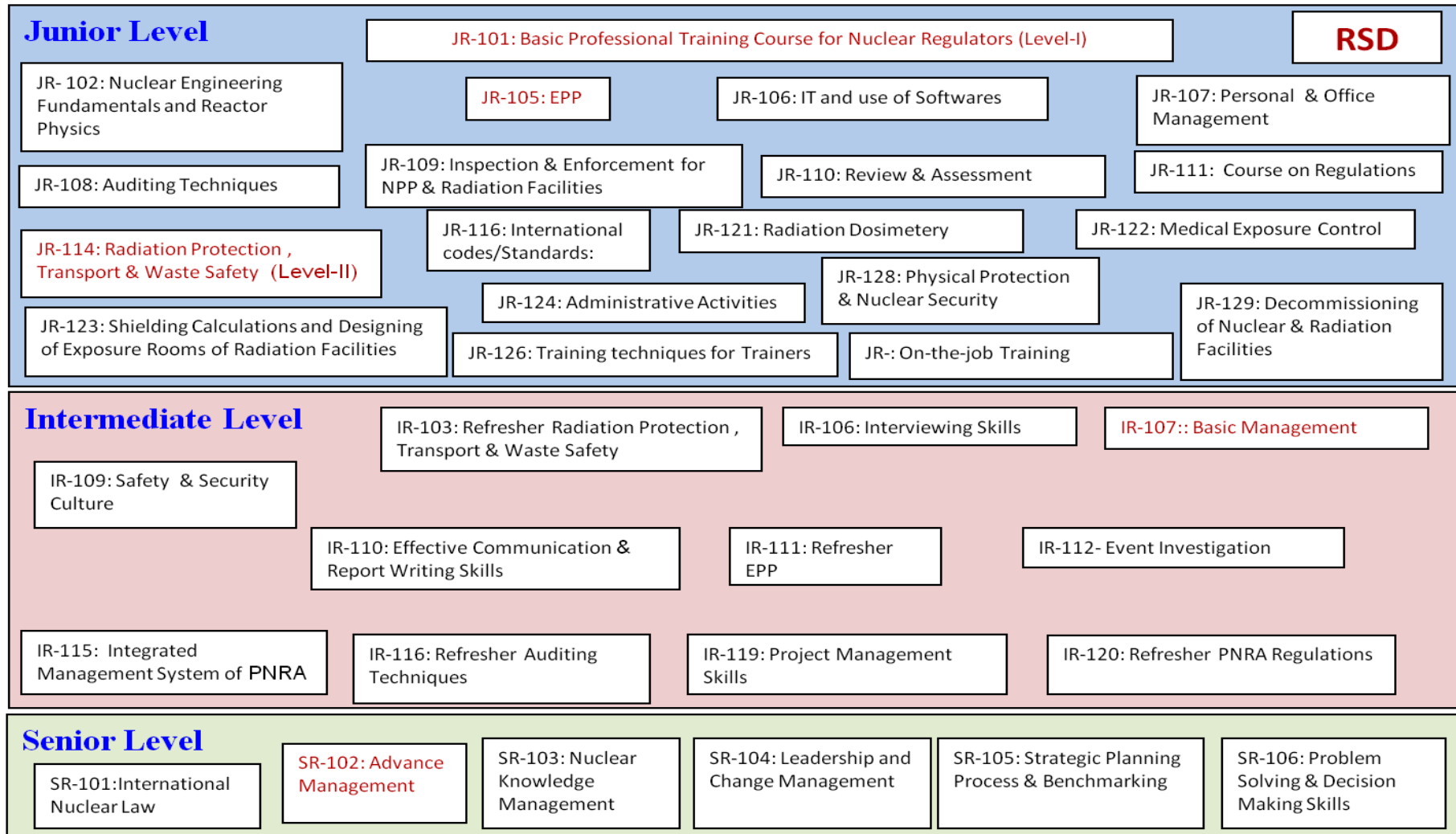
Directorate of Radiation Safety (RSD)

RSD is mainly responsible to

- Establish and maintain regulatory framework for **radiation safety, protection of patients and emergency preparedness and response**
- **Review and assessment of licensees' submissions;**
- Maintain and operate the **Nuclear and Radiological Emergency Coordination Centre**; and
- Assess safety performance of radiation facilities against **Performance Objectives and Criteria (PO&Cs)**.



Training Program for RSD





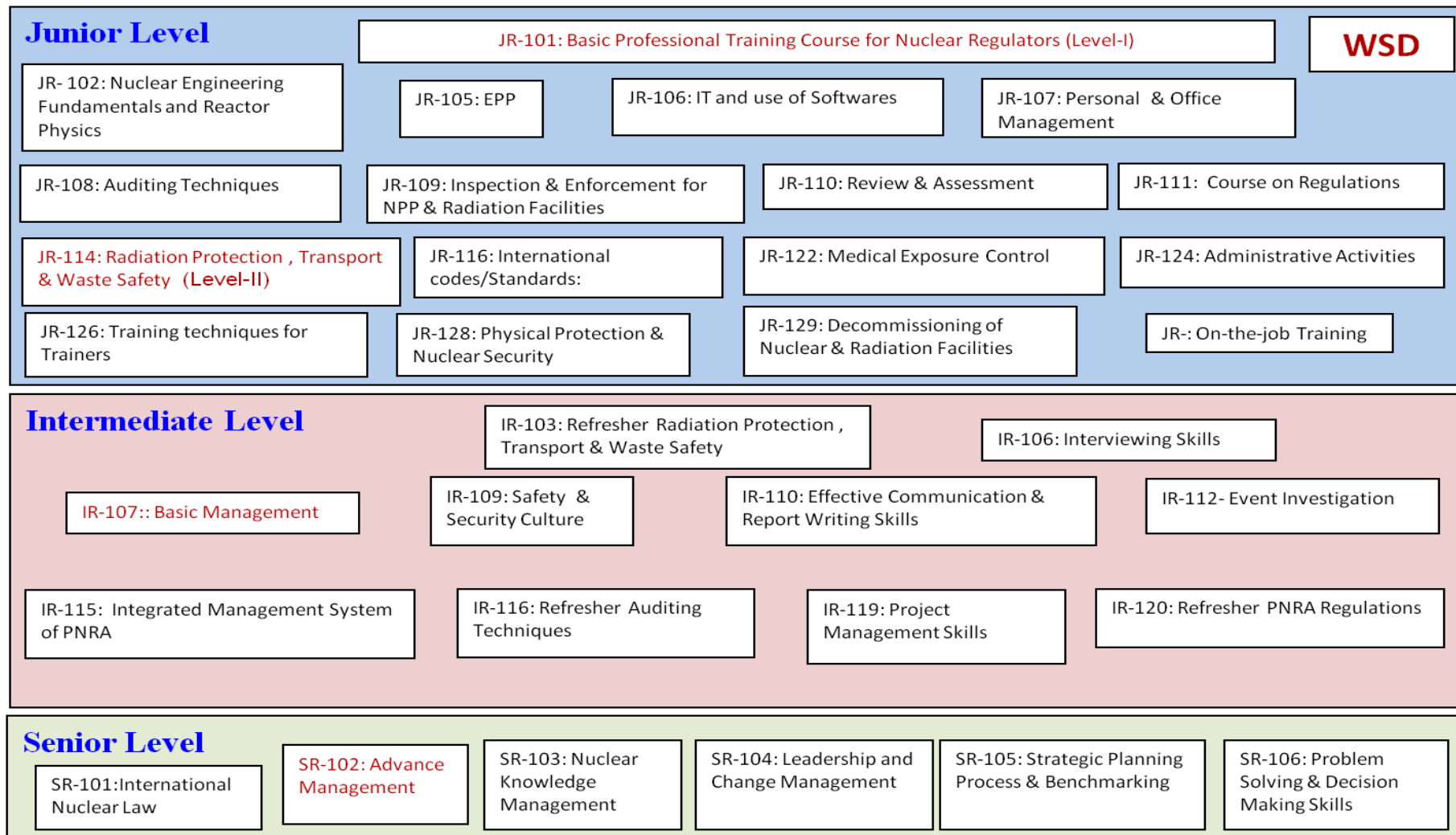
Directorate of Transport and Waste Safety (WSD)

WSD is mainly responsible to

- Establish and maintain regulatory framework for **transport, waste, spent nuclear fuel, and decommissioning**;
- License / certify transport packages including spent fuel cask, radioactive waste pre-disposal & disposal facilities, independent spent nuclear fuel storage facilities and decommissioning activities;
- Review and assess licensees' submissions.



Training Program for WSD





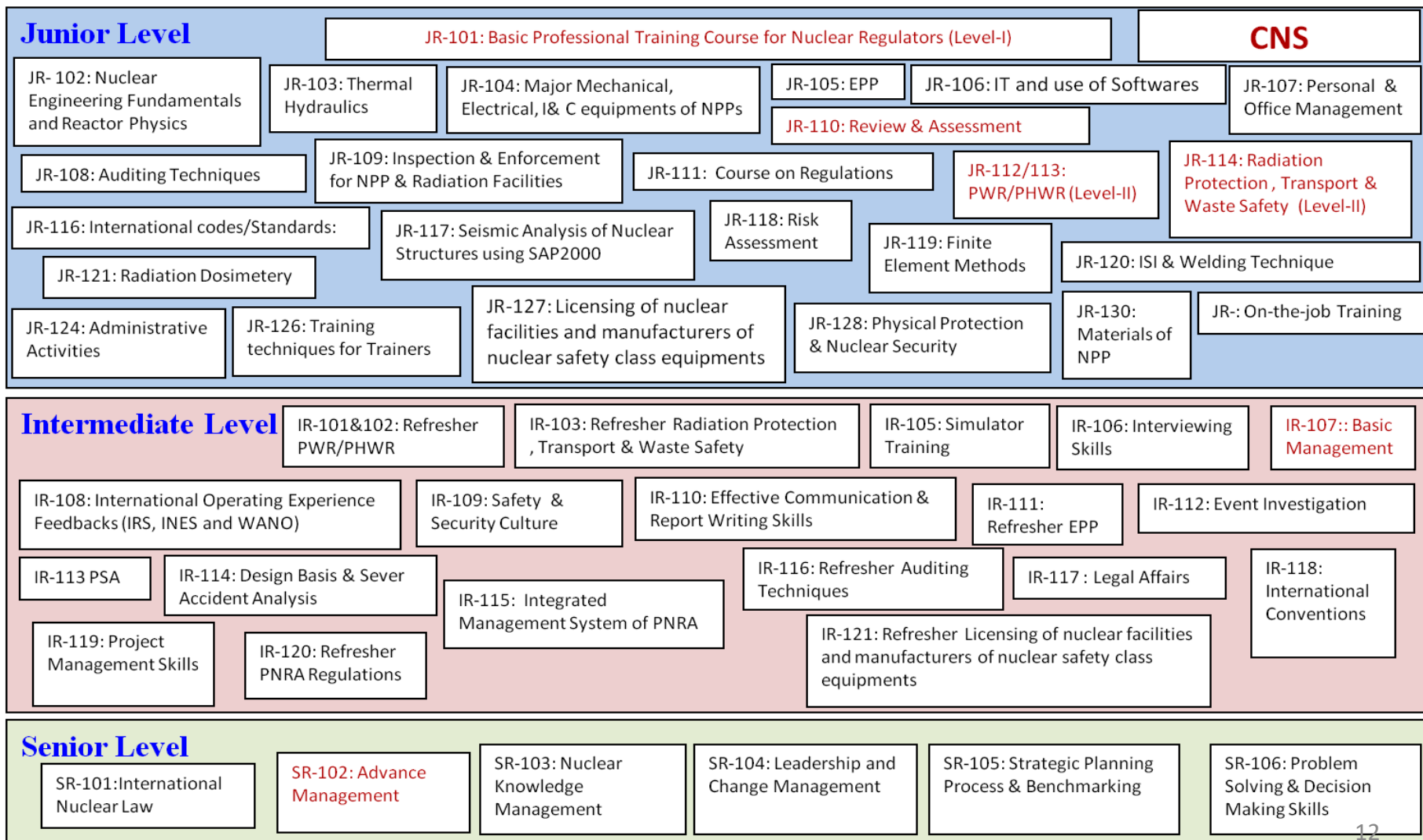
Centre for Nuclear Safety (CNS)

CNS is mainly responsible to

- Perform review and assessment of licensing submissions of **nuclear installations**;
- Performs audit calculations of **deterministic and probabilistic safety analysis, stress/structure/tsunami and EPZ** submitted by the licensees
- Perform **R&D** in safety analysis.
- **Support PNRA departments** in inspections of nuclear installations and radiation facilities.



Training Program for CNS





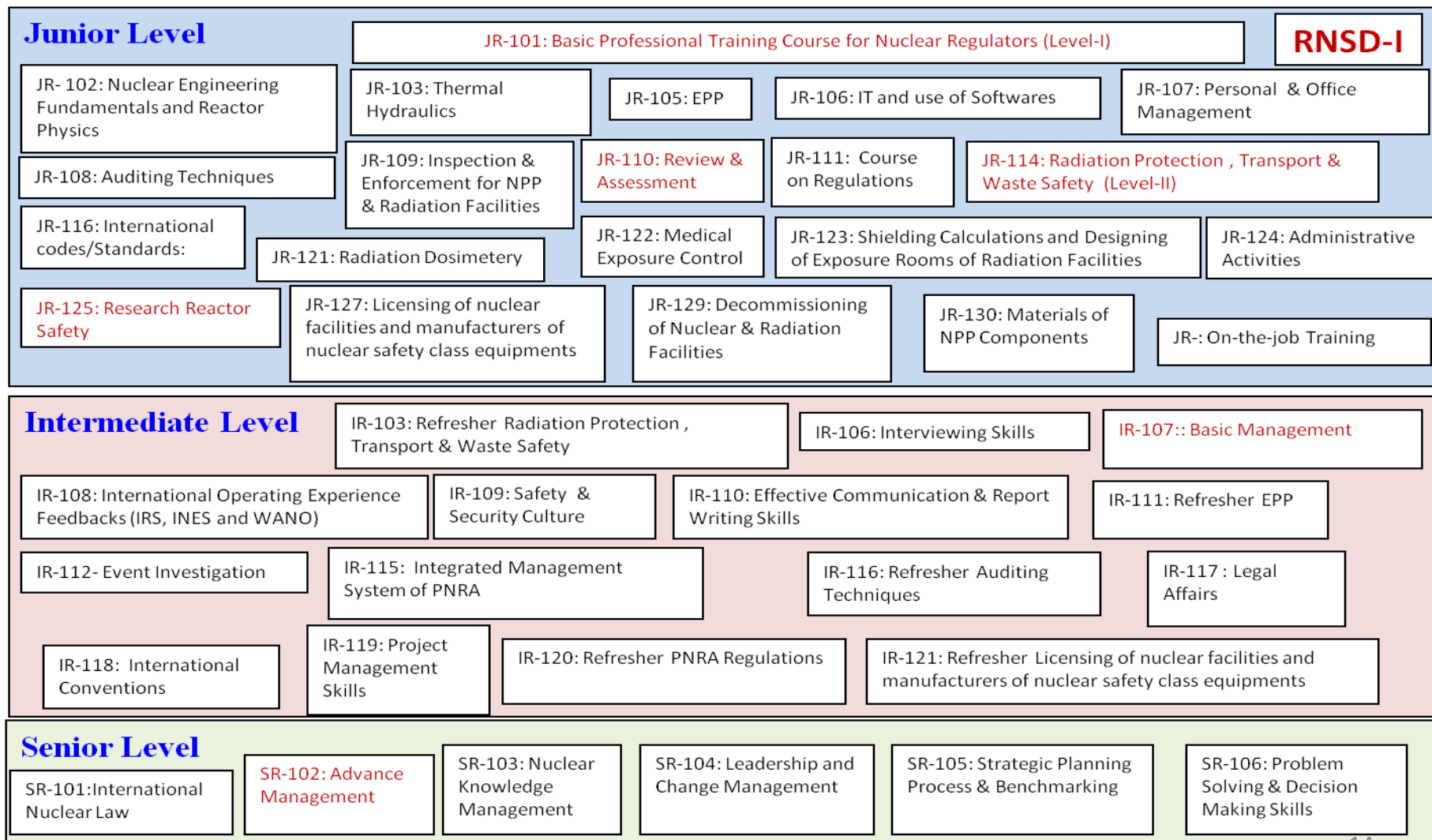
Regional Nuclear Safety Directorate I

RNSD-I is located in Islamabad and is mainly responsible for:

- Review & assessment, licensing, inspection & enforcement of **radiation facilities**
- Review & assessment and inspection & enforcement of **research reactors, MPF and waste disposal facilities**;
- Licensing of **operating personnel** of RRs & MPF;



Training Program for RNSD-I





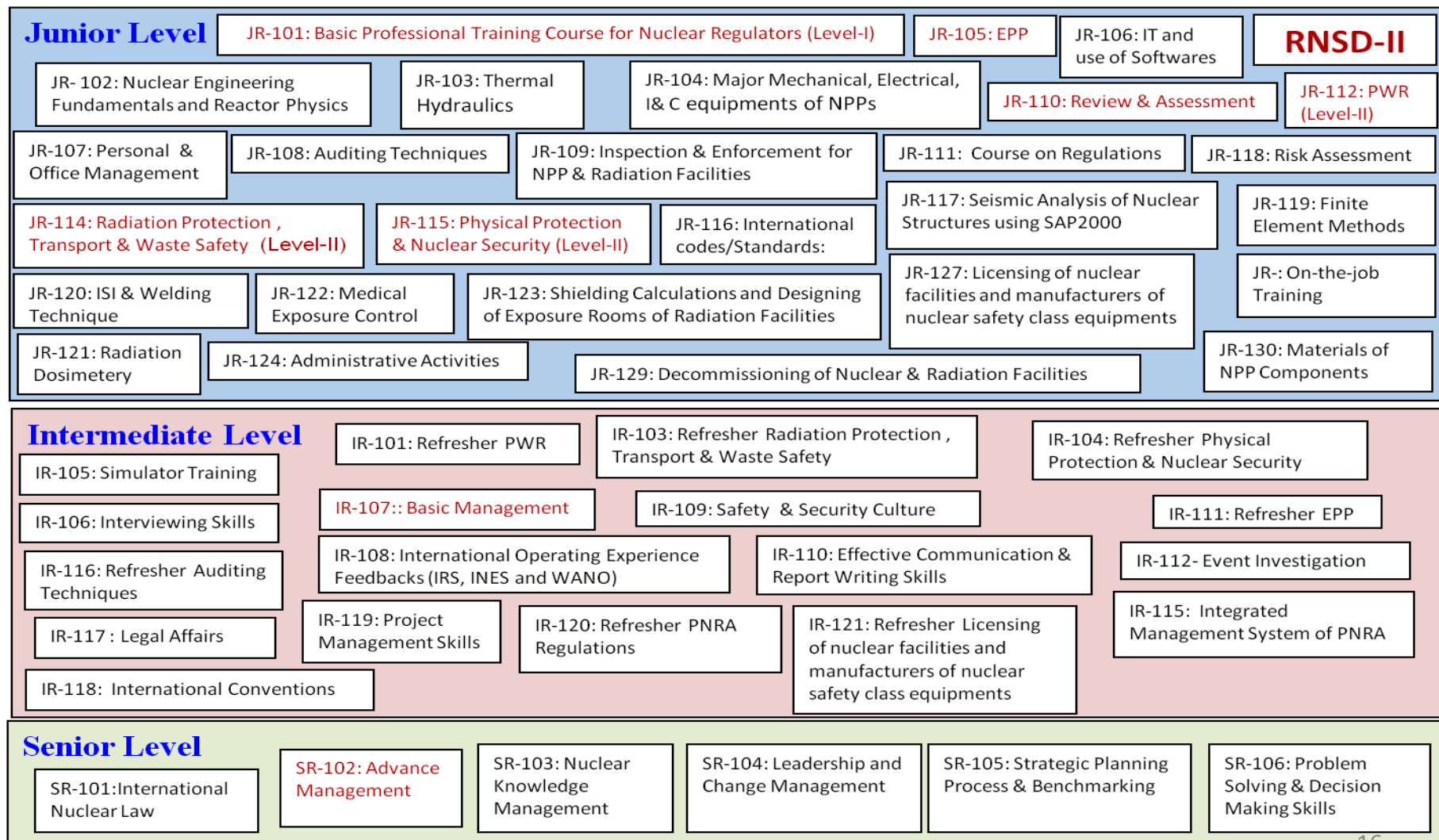
Regional Nuclear Safety Directorate II

RNSD-II is located in Chashma and is responsible for regulatory **inspections and enforcement of NPPs**

- Review & assessment of licensing submission of NPPs
- Licensing of plant **operating personnel**;
- Review & assessment, licensing, inspection & enforcement of **radiation facilities**



Training Program for RNSD-II





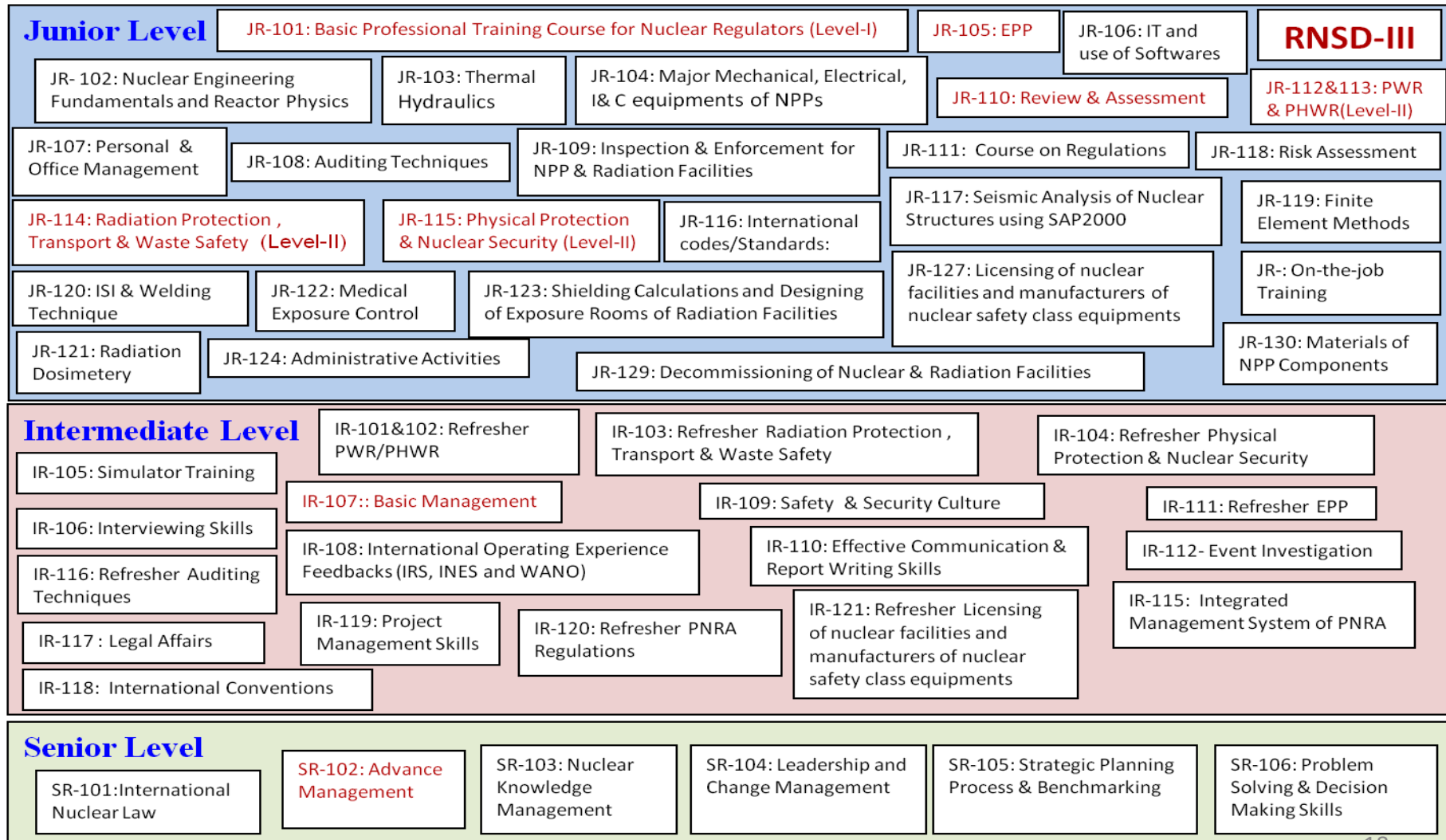
Regional Nuclear Safety Directorate III

RNSD-III is located in Karachi and is responsible for **regulatory inspections and enforcement of NPPs**

- Review & assessment of licensing submissions of NPPs
- Licensing of plant **operating personnel**
- Review & assessment, **licensing, inspection & enforcement of radiation facilities** located in Sindh Province and Baluchistan Province.



Training Program for RNSD-III







Personnel Qualification and Position Authorization



Tiered Approach

- The TNA study identified a number of courses out of which some are considered to be the **core courses**.
- It is recommended that all regulatory staff, no matter what the nature of regulatory activities they are engaged in, **should attend the core courses Level-I and Level-II**



Level-I Course

- **It is the basic professional training course useful for personnel in the beginning of their regulatory careers.**
- **PNRA has designed and conducted multiple times the Level-I courses, taking into account the IAEA BPTC training material, to cover:**
 - **Nuclear and Radiation Safety**
 - **Regulatory Control**
 - **Physical Protection & Nuclear Security**
 - **Interpersonal Skills**
 - **Organizational Rules and Codes**



Level-II Course

- **After a year of work experience**, the regulatory officials **have to attend Level-II training** course relevant to their assigned work area.
- **Following Level-II Courses have been designed and conducted many times for junior regulators :**
 - **Professional Training Course on PWR NPPs Systems**
 - **Professional Training Course on Radiation Protection and Waste and Transport Safety**
 - **Professional Training Course on Physical Protection and Security of Nuclear Installations**
 - **Professional Training Course on PHWR NPPs Systems**



Designation of Senior Engineer or Senior Scientific Officer

- University graduates inducted into PNRA are designated as Assistant Engineers (AE) or Scientific Officers (SO)
- PNRA promotion rules, in addition to length of service and performance requirements, specify that **only those AEs and SOs would be eligible for promotion to Senior Engineer or Senior Scientific Officer who have attended Level-I and Level-II**
- This requirement is **applicable for all categories of regulatory professionals – licensing specialists, inspectors, reviewers & assessors, etc.**



Designation of Principal Engineer or Principal Scientific Officer

- PNRA promotion rules, in addition to length of service and performance requirements, also specify that **only those Senior Engineers or Senior Scientific Officers would be eligible for promotion to Principal Engineer or Principal Scientific Officer who have completed Basic Management Course**
- This requirement is **applicable for all categories of regulatory professionals – licensing specialists, inspectors, reviewers & assessors, etc.**



Designation of Senior Principal Engineer or Chief Scientific Officer

- PNRA promotion rules, in addition to length of service and performance requirements, also specify that **only those Principal Engineers or Principal Scientific Officers would be eligible for promotion to Principal Senior Engineer or Chief Scientific Officer who have completed Senior Officers Management Course from PIEAS University**
- This requirement is **applicable for all categories of regulatory professionals – licensing specialists, inspectors, reviewers & assessors, etc.**



Pre-requisite training for authorized inspectors

- An **authorized inspector** is required to possess a valid **inspector card**
- Criteria is **applicable to all categories of inspectors** – NPP safety, research reactors, radiation safety and physical protection
- The criteria for inspector card includes the successful completion of:
 - PNRA **level-I & level-II** (or equivalent) professional **training** courses.
 - **Training** Course on **PNRA Regulations**
 - **Training** Course on **Inspection & Enforcement Techniques**.

Ensuring that trainee inspectors meet the criteria and **record-keeping of credentials of each authorized inspector** are maintained by the **Directorate General of Inspection and Enforcement**.



Refresher Training



Update of specific trainings

- Inclusion of new facilities in the regulatory net and updates in regulatory framework necessitate revision of training modules and **retraining**
- PNRA organized training course on 1100MWe PWR plant Systems for inspectors and safety assessment group at the plant construction site to understand the new systems and new features of the plants
- **Promulgation of new regulations or revision** in existing ones necessitate revision of Training Course on PNRA Regulations which has been run and re-run many times
- **Feedback to revise training courses is submitted to NISAS** as well as to the Board of Directors. So update of the training is ensured.



Re-appearance of experienced officials in initial and mandatory courses (1/2)

- A **specific percentage of experienced regulatory professionals** who have attended Level-I, Level-II, PNRA Regulations and I&E Techniques **are allowed to attend whole or part of the** training event as refresher
- Training courses on PNRA Rules of Business and Policies and IT Skills have been **repeated many times. Senior professionals are encouraged to attend**
- HRD regularly arranges trainings at other national institutes in interpersonal skills (communication, speaking, writing, office management, time management, etc.) for fresh and experienced officers



Re-appearance of experienced officials in initial and mandatory courses (2/2)

- **PNRA Management has mandated the compulsory conduct of Level-II in Radiation Protection even if there are no fresh participants in the course.**
- **Keeping in view that the end objective of regulatory activities is radiation protection, all experienced regulators, even if their domains are NPP safety or nuclear security, have been mandated to attend Level-II in RP to refresh their RP knowledge and learn advances in specialized topics like dose constraints, radiological engineering, shielding calculations, etc.**



Refresher Training for Licensees

Every three years or sooner some courses are conducted for licensees. Many courses are repeated as refresher :

- Training Course on PNRA Regulations
- Training Course on Radiation Safety for **Industrial Radiographers**
- Training Course on Radiation Safety for **RPOs**
- TC on **QA in Radiotherapy (for medical physicists and BMEs)**
- TC on **QA in Medical Imaging (ditto)**
- TC on **Radiation Shielding Calculations for Medical Facilities (also attended as refresher by PNRA officials)**



Conclusion

- PNRA has systematically instituted **training schemes for different job positions** (Licensing Specialists, Safety Assessor, Inspector) in both nuclear and radiation safety
- The **link between personnel qualification and position authorization is established for different job positions** (Licensing Specialists, Safety Assessor, Inspector) in both nuclear and radiation safety