



CHAPTER -03

REGULATORY INSPECTIONS



REGULATORY INSPECTIONS

Regulatory Inspections (RI) is one of the key processes of AERB through which it ensures that the activities performed by the Licensee during all the phases (viz. siting, construction, commissioning, operation, decommissioning, and release from regulatory control) of the life cycle of Nuclear and Radiation Facilities are executed in compliance with the conditions of the License and relevant safety requirements.

3.0 Regulatory Inspection Programme

A comprehensive RI programme is developed and implemented every year, to check that licenced activities/facilities are conducted/operated in accordance with regulatory requirements and in conformity with safety and security objectives. The programme is prepared following graded approach. The frequency, scope and rigour of inspections takes into account the hazard potential of the facility and the consenting stage of the facility. Inputs from previous inspection findings and safety reviews are also considered during the programme development. Adequate provisions for special inspections and reactive inspections (e.g., safety significant events) are incorporated in the programme to take care of unforeseen situations.

Inspections are carried out periodically as well as in special circumstances. Generally, the inspections are carried out with prior announcement. AERB also carries out unannounced inspections with specific objectives. AERB prepares an annual plan based on graded approach, for inspection of nuclear and radiation facilities considering the following:

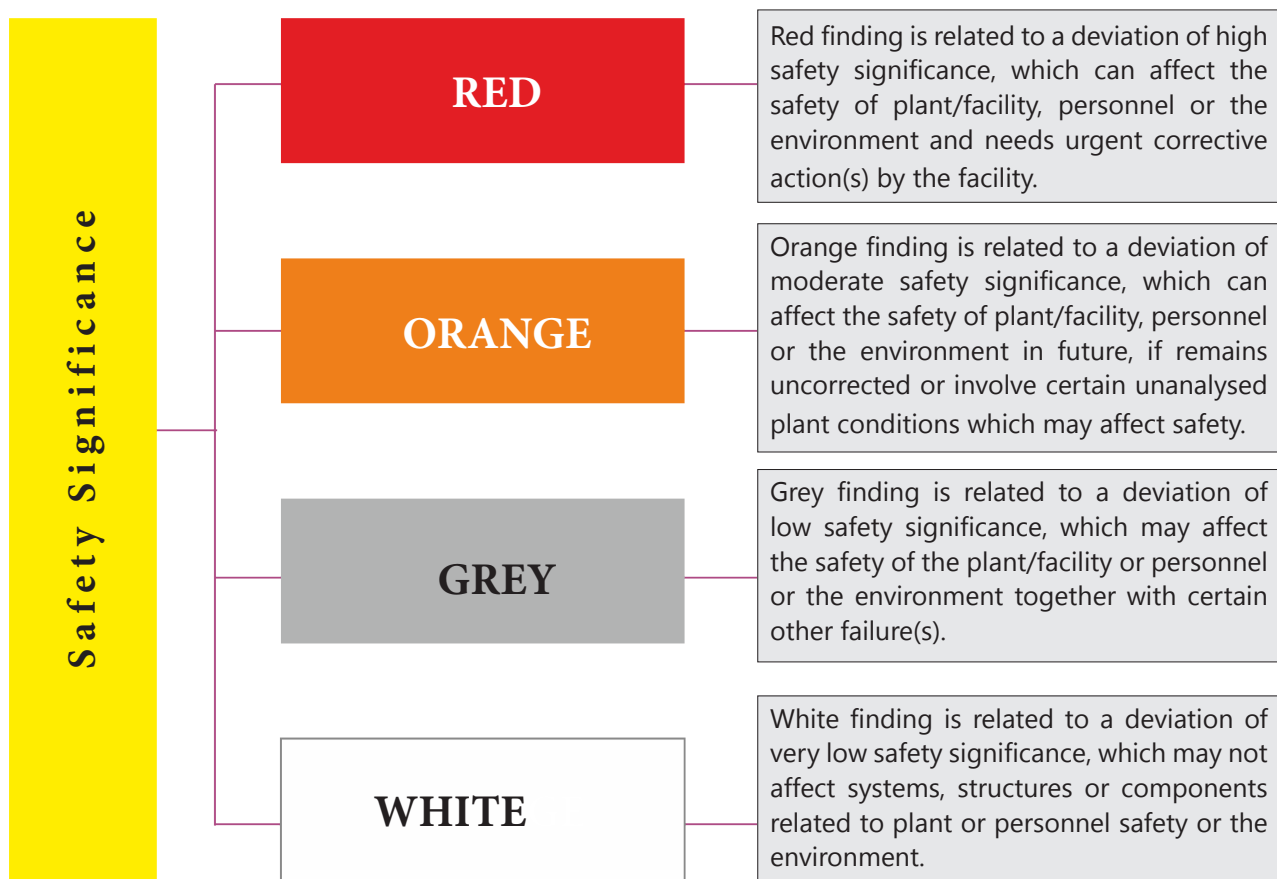
- i. Probable degree and nature of the hazard associated with the facility or activity
- ii. Outcome of safety review
- iii. Progress of activities at the facility
- iv. Experience of previous inspections
- v. Available resources, and
- vi. Guidelines provided in regulatory and IMS documents.

The frequency, scope and rigour of regulatory inspections depend on the hazard potential of the facility and the consenting stage of the facility.

The inspection findings made during the regulatory inspections are broadly categorised adopting a graded approach for follow up of their review and resolution. The facility is required to submit an action taken report on the deficiencies brought out during the inspection within a specified timeframe.

3.1 Graded Approach in Determining Safety Significance of Deviations

Graded approach is followed in determining the safety significance of the deviations observed during the regulatory inspections of nuclear and radiation facilities. The reported deviations are categorised as White, Grey, Orange and Red findings, in the increasing order of safety significance, as described here:



AERB follows-up implementation of the actions for resolution of the reported deviations. Orange and Red findings are reviewed for appropriate follow-up or enforcement actions. The closure of the Grey, Orange and Red findings are considered by AERB after review and acceptance of the corrective actions. Resolution of White findings, by the Licensee is checked by AERB inspectors on sample basis during subsequent inspections to get the information of holistic treatment of Human Organisation & Technical (HOT) factors as an input for safety culture assessment.

Facilities have to submit the action taken report for all types of inspection findings for review and consideration by AERB for closure.

AERB also initiates enforcement action, if in its opinion, the licensee has violated the conditions of the licence wilfully or otherwise or misinformed

or did not disclose the information having bearing on safety, after specifying the reasons for such action. The RI team can also initiate on the spot enforcement actions, if necessary, in case of serious non-conformances.

The enforcement actions may include one or more of the following:

- i. A written directive for satisfactory rectification of the deficiency or deviation observed during inspection and/ or safety review
- ii. Written directive to applicant/licencee for improvement within a reasonable timeframe;
- iii. Orders to curtail or stop the activity;
- iv. Modification, suspension or revocation of licence/consent; and
- v. Initiation of legal proceedings under provisions of the Atomic Energy Act, 1962.

3.2 Regulatory Inspections of Nuclear, Industrial & Radiation Facilities

AERB carries out regulatory inspections of the nuclear, industrial and radiation facilities to ensure compliance with the AERB safety requirements and stipulations. In inspection programme of nuclear and industrial facilities, the emphasis is on aspects related to project management, safety culture, civil construction, quality assurance, equipment storage & preservation, fabrication & erection of major safety related components, documentation, commissioning & operation activities, occupational health & safety, fire safety, nuclear security, radiological monitoring and emergency preparedness.

which provides important inputs for safety review and inspections. This has led to establishment of continuous regulatory oversight at these sites, covering twelve operating, four under commissioning, and five under construction NPPs. At other NPP sites, AERB conducts unannounced inspections also, apart from baseline announced inspections.

In case of radiation facilities, the inspection plan envisages prioritization of inspection of the facilities having reported cases of radiation exposures exceeding the prescribed dose limits and the facilities having safety issues identified from safety review/inspections e.g. periodic safety status reports are not received, disused radioactive sources pending for disposal,



AERB Inspection Team at KAPS 1&2

Additional inspections are conducted to gather information after important events, or to observe specific activities.

AERB has posted onsite observers at four NPP sites (Rawatbhata, Kalpakkam, Kakrapara and Kudankulam) for observing activities at the operating as well as under construction plants at these sites. The important observations are reported to AERB Headquarter (HQ) on daily basis

moderate safety significance (Orange category) inspection findings during previous inspection etc.

The regulatory inspections are carried out by AERB HQ located at Mumbai and its regional regulatory centres viz.; Eastern Regional Regulatory Centre (ERRC), Kolkata, Northern Regional Regulatory Centre (NRRC), New Delhi and Southern Regional Regulatory Centre (SRRC), Chennai.

The information on RIs conducted at various nuclear, industrial and radiation facilities during the year is given in the following sections:

3.2.1 Regulatory Inspections of Nuclear Facilities and Industrial Facilities

During the year, 129 regulatory inspections of nuclear and industrial facilities were conducted which included Regular inspections, Special inspections (to observe any specific activity or

for specific issues identified during licensing, safety review or regulatory inspection processes), and reactive inspections based on the safety significance of the reported events.

During the inspections (Incl. Regular, Special and Reactive inspections), there were 13 deviations reported in Orange Category and no deviation was reported in Red Category. The details of Special and reactive inspections conducted in the year 2023 are given in Table 3.1

Table 3.1: Special and Reactive Inspections Conducted for the Year 2023

Facility	Nature of Inspection	Purpose
Kaiga Site	Special	An inspection of Environmental Survey lab & Onsite Emergency Support Centre(OESC) was conducted on March 27, 2023 to check the present status and preparedness for monsoon season.
KKNPP-3&4	Special	An inspection was conducted on April 25-28, 2023 to inspect welding activities of Main Coolant Pipelines (MCP) at KKNPP-3.
KAPP-3&4	Special	<ul style="list-style-type: none"> An inspection was conducted during the period May 22- June 07, 2023 to cover KAPP-4 RB Proof Test & ILRT, PHT Hot Conditioning preparedness and shutdown refuelling/ other activities and to cover plant start-up related activities of KAPP-3. An inspection was conducted in view of the incident involving injury to a worker due to sudden release of air pressure from coolant channels on August 22, 2023. In this incident, air ingressed from Emergency Core Cooling System (ECCS) water accumulator, which resulted in ejection of temporary caps of coolant channels and sudden release of air pressure. A special RI on Nuclear Security aspects was carried out to check site's preparedness and compliance to nuclear security requirements.

Facility	Nature of Inspection	Purpose
Rajasthan site	Special	<ul style="list-style-type: none"> Inspection was conducted during May 02-04, 2023 to check Station preparedness towards removal and transfer coolant channel components during EMCCR campaign of RAPS-3. Inspections were conducted during August 23-24, 2023 and Dec 04-05, 2023 to check Station preparedness for activities associated with installation of coolant channels during EMCCR campaign of RAPS-3. Inspection of OESC-RR site was carried out during October 10-11, 2023 to assess the site conditions.
PFBR	Reactive	An event of sodium leakage from the SGDHR Loop-2 occurred at PFBR site on December 8, 2023. An unannounced reactive RI was conducted to investigate the event.
HWP-Thal	Special	An inspection was conducted on December 23, 2023 to check compliance w.r.t an orange category deviation reported in previous regular inspection.

The number of inspections (Including Regular, special and reactive inspections) conducted in each of Nuclear Facilities (under construction &

commissioning), Operating NPP and Industrial & Fuel Cycle Facilities are given in Table 3.2, 3.3 and 3.4 respectively.

Table 3.2: RIs of NFs (Under Construction and Commissioning)

Project(s)	No. of Inspections	Project(s)	No. of Inspections
KKNPP-5&6	2	DFRP*	3
KKNPP-3&4	3	NFC-Kota*	3
KAPP-3&4	6	KAIGA-5&6	2
RAPP-7&8*	4	GHAVP	2
PFBR	4	OESC RR site	1
Total Inspections			30

*Inspection covering Nuclear Security Aspects

Table 3.3 RIs of Operating Nuclear Facilities & NPCIL HQ

Facilities	No. of Inspections	Facilities	No. of Inspections
Operating NPPs			
TAPS-1&2	4	NAPS-1&2	6
TAPS-3&4	5	KAPS-1&2	3
TAPS Site*	1	KAPS Site *	1
RAPS-1&2	3	KGS-1&2	5
RAPS-3&4	6	KGS-3&4	5
RAPS-5&6	4	KGS Site*	1
RR Site*	1	KKNPP-1&2	4
MAPS-1&2	3	KK Site*	1
Kalpakkam Site*	1	RAPPCOF*	1
NPCIL- HQ	1		
IGCAR Facilities			
FBTR, KAMINI, IFSB	2	FRTG, RCL, RML	3
CORAL*			2
Total Inspections		63	

* Inspection covering Nuclear Security Aspects

Table 3.4: Regulatory Inspections of Industrial and Fuel Cycle Facilities and HWB HQ

Facility	No. of Inspections	Facility	No. of Inspections
IREL-HQ	1	UCIL-Turamdih Mine	1
HWP-Kota*	3	UCIL-Turamdih Mill	2
HWP-Thal	2	UCIL-Mohuldih Mine	1
HWP-Hazira	1	UCIL-Bagjata Mine	1

Facility	No. of Inspections	Facility	No. of Inspections
HWP-Manuguru	2	UCIL-Bhatin Mine	1
HWP- Manuguru*	1	UCIL-Narwapahar Mine	1
HWP-Baroda	2	UCIL-Banduhurang Mine	1
ECIL- Tirupati	1	UCIL-Tummalapalle Mine	1
UCIL-Jaduguda Mill	2	UCIL- Tummalapalle Mill	2
UCIL-Jaduguda Mine	1	IREL-Udyogamandal	2
NFC-Hyderabad	2	IREL-OSCOM	2
KMML- Chavara	1	IREL- Manavalakurichi	1
		IREL- Chavara	1
Total Inspections		36	

* Inspection covering Nuclear Security Aspects

3.2.2 Inspection of Headquarters (HQs) of NPCIL and IREL HQ

The inspection of NPCIL HQ is being conducted on yearly basis covering 2-3 directorates in each year. During the year 2023, inspection of the Directorate of Technical, consisting of Directorates of Engineering, Electrical and Instrumentation, Technology Development, Procurement, Reactor Safety & Analysis, and Health, Safety & Environment and Directorate of Human Resources were covered.

In-line with the inspections of NPCIL HQ, it was decided to conduct regulatory inspection of HQ of other DAE facilities (apart from NPCIL HQ) also on rotation basis to check the activities and functioning of headquarter. Accordingly, an inspection of IREL-HQ was conducted.

3.3 Regulatory Oversight of QA Activities during Manufacturing of Safety Related Reactor Equipment/Component

As a part of regulatory oversight of licensee's QA activities during manufacturing of safety related equipment/component of NPPs at vendor premises, AERB inspectors observed NPCIL activities at the premises of four vendors viz., M/s BHEL Bhopal, M/s Godrej, Dahej, M/s Walchandnagar Industries Limited (WIL) and M/s KSB, Pune and associated NPCIL Regional Centre.

3.4 Regulatory Inspection of Radiation Facilities

Radiation Facilities in the country are diverse in nature and range from diagnostic X-ray installations to proton therapy installations in

the fields of medical application of radiation. Similarly, simple low activity nucleonic gauging devices to complex high activity gamma radiation processing facilities also exist in the fields of industrial application of radiation. AERB has adopted a graded approach depending on the radiation risks posed by such facilities, in its regulatory inspection programme and conducts periodic inspections under its base-line inspection programme to oversee the implementation & functioning of a radiation protection programme. Special inspections to observe type approval performance tests, commissioning tests, specific issues identified during licensing, safety review or regulatory inspection processes are also carried out in addition to reactive inspections in response to significant events and/or complaints/grievances. These inspections are conducted either as announced inspections or as unannounced inspections.

Regulatory inspection of DAE R&D facilities like BRIT, RAPPCOF, RRCAT, and VECC were carried out covering radiation protection, occupational health & safety and fire protection aspects.

This year, 942 regulatory inspections of radiation facilities were conducted which included regular inspections, special inspections, and reactive inspections. Most of the regular inspections during the third and fourth quarter of the year were conducted as unannounced inspections to know the as-is safety status of the facility and conduct of activities.

The number of inspections conducted in different type of radiation facilities are given in Table 3.5

Table 3.5: Regulatory Inspections of Radiation Facilities

Radiation Facility	Type of Inspection				Total
	Regular		Special	Reactive	
	Announced	Unannounced			
Calibration	1	3	-	-	4
Consumer Products and Scanning	2	-	8	-	10
Diagnostic Radiology	125	104	50	3	282
Gamma Irradiation Chamber	16	15	-	-	31
Gamma Radiation Processing	1	1	2	1	5
Industrial Radiography	80	111	5	2	198

Radiation Facility	Type of Inspection				Total
	Regular		Special	Reactive	
	Announced	Unannounced			
Industrial/Research Accelerator	6	9	14	-	29
Medical Cyclotron	5	1	-	-	6
Nuclear Medicine	85	65	1	1	152
Nucleonic Gauging Devices	2	4	-	-	6
Radiotherapy	111	82	8	4	205
Research Application	1	-	1	-	2
Sealed Sources	2	1	-	-	3
Well Logging	4	5	-	-	9
Total	441	401	89	11	942

