

Radiation regulating bodies




What is regulatory body?

- Regulatory body (Regulatory authority, Regulatory agency) is a public authority or government agency responsible for exercising autonomous authority over some area of human activity in a regulatory or supervisory capacity



FEATURES OF RADIATION REGULATORY BODIES

- A regulatory authority be established by the government to regulate conduct and introduction of any practice involving sources of radiation.
 - Regulatory authority must be independent of registrants, licensees, designers and constructors of radiation sources used in practices.
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- A single regulatory authority is responsible for all aspects of radiation protection and safety in a country.

In some countries, regulatory responsibility for different aspects of radiation protection and safety may be divided between different authorities

- Assessment of applications for permission to conduct practices pertaining to radiation exposure.

Authorization of practices involving radiation and sources involved.

conduct of periodic inspections

Quality assurance

Assessing effectiveness of radiation protection and safety measures for each authorized practice.



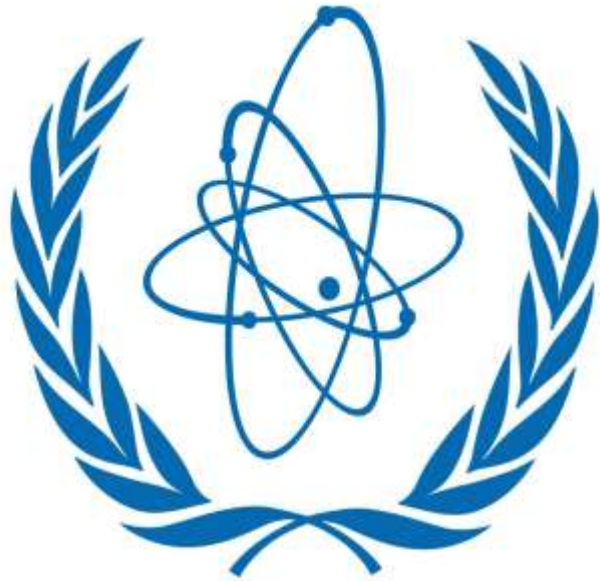
Some radiation regulating bodies are

INTERNATIONAL REGULATING BODIES:-

- INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)
- INTERNATIONAL COMMISSION ON RADIATION PROTECTION (ICRP)
- NATIONAL COUNCIL ON RADIATION PROTECTION AND MEASUREMENTS (NCRP)
- WORLD HEALTH ORGANIZATION (WHO)



In India the board is the AERB (Atomic energy regulatory board)



IAEA

International Atomic Energy Agency

INTERNATIONAL
ATOMIC ENERGY
AGENCY (IAEA)

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

ORIGIN:-

- Established in 1957
- Created because ___
- deep fears and expectations because of the discovery of nuclear energy.

Member Nations

- SOVIET UNIONS
- EUROPE
- UNITED KINGDOM
- FRANCE

ROLE OF INTERNATIONAL ATOMIC ENERGY AGENCY

- They help with nuclear science and technology safety with nuclear weapons
- Help international security
- Social, economic and environmental development
- Help other nations use nuclear power safely
- Increase safety towards human health
- Improve crops with nuclear techniques
- Monitor Climate changes in oceans
- Enhance water sufficiency



INTERNATIONAL
COMMISSION ON
RADIATION
PROTECTION (ICRP)

INTERNATIONAL COMMISSION ON RADIATION PROTECTION (ICRP)

- An independent, international organization that advances for the public benefit the science of radiological protection, in particular by providing recommendations and guidance on all aspects of protection against ionising radiation.
- HEADQUARTERS:- Ottawa, Canada.
- CHAIRPERSON :- Dr. Claire Cousins

History of ICRP

- ICRP was established in 1928 at the second International Congress of Radiology to respond to growing concerns about the effects of ionizing radiation being observed in the medical community.
- At the time it was called the International X-ray and Radium Protection Committee, but was restructured to better take account of uses of radiation outside the medical area and given its present name in 1950.

Cont....

- Originally, ICRP published its recommendations and advice as papers in various scientific journals in the fields of medicine and physics.
- Since 1959, ICRP has its own series of publications, since 1977 in the shape of a scientific journal, the Annals of the ICRP, which is published Elsevier Science.

ICRP Principle

The ICRP uses the following overall principles for all controllable exposure situations.

- **Justification**:- No unnecessary use of radiation is permitted, which means that the advantages must outweigh the disadvantages.
- **Limitation**:- Each individual must be protected against risks that are too great, through the application of individual radiation dose limits.

Cont....

Optimization: This process is intended for application to those situations that have been deemed to be justified.

It means "the likelihood of incurring exposures, the number of people exposed, and the magnitude of their individual doses" should all be kept as Low As Reasonably Achievable (known as ALARA or ALARP).



**ALARA (As low as
reasonably achievable)**

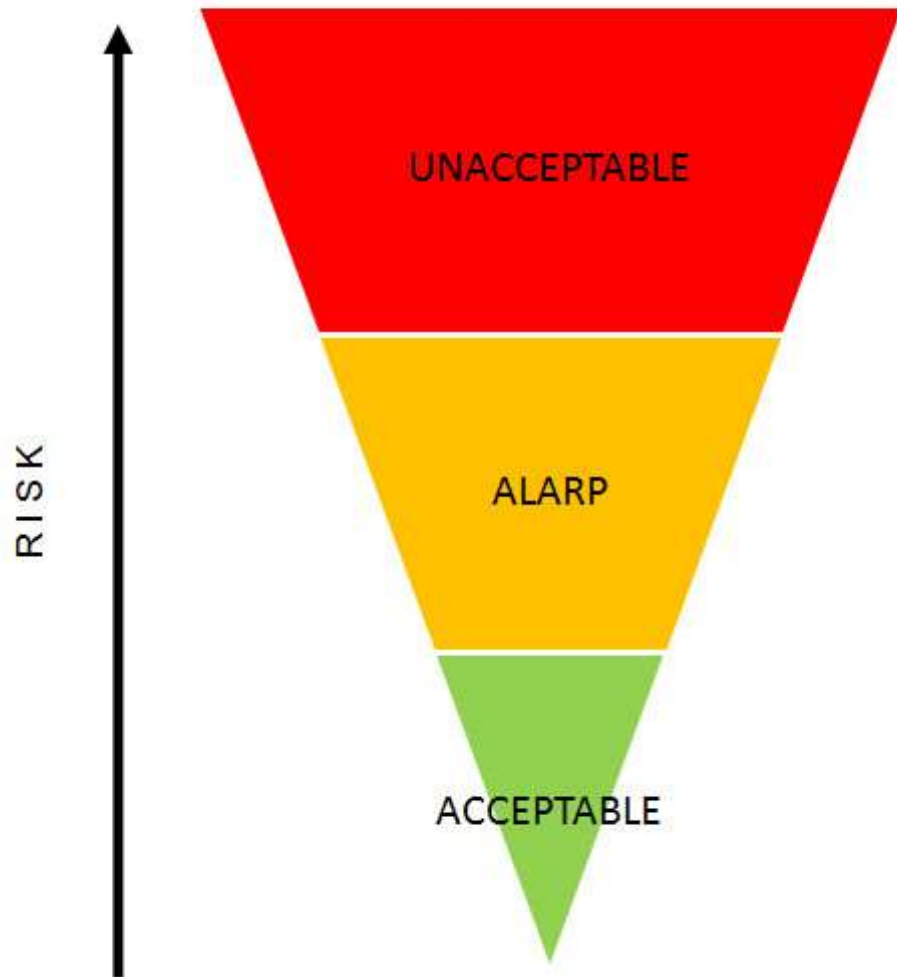
alara

- ALARA (As Low As Reasonably Achievable) is a safety principle designed to minimize radiation doses and releases of radioactive materials.
- More than merely best practice, ALARA is predicated on legal dose limits for regulatory compliance, and is a requirement for all radiation safety programs.

ALARA Principle

The Principle Of ALARA depends upon three things:

- **Time**:- limit time in room with radiation present.
- **Distance**:- reduce amount of radiation exposure by moving as far from the source of radiation as possible.
- **Shielding**:- protect yourself by wearing lead apron, the lead will absorb most of scattered and secondary radiation.



Alarp (as low as reasonably practicable)

alarp

It is an acronym for an important principle in exposure to radiation and other occupational health risks and stands for As Low As Reasonably Practicable.

The aim is to minimize the risk of radioactive exposure or other hazard while keeping in mind that some exposure may be acceptable in order to further the task at hand.

NATIONAL COUNCIL ON
RADIATION PROTECTION AND
MEASUREMENTS (NCRP)



National Council on Radiation
Protection and Measurements

WHAT IS NCRP?

National council on radiation protection and measurement is a regulatory board in US. That deals with the radiation protection among human being and environment.

Aim

- It support the radiation protection by providing independent scientific analysis, information and recommendation that represent the agreement of leading scientist.
- It also encompasses the co-operation with different organisms and that concern with related aspects of radiation protection and measurement.

History of ncrp

- NCRP is an US organization
- Established in 1929.
- Initially organization was informal collective of scientists seek for accurate information and appropriate recommendation for radiation protection.
- 1946 organization name changed name to National Committee on Radiation Protection and measurement.
- 1964 US congress reorganized the organization as National Council on Radiation Protection and Measurement.

STRUCTURE OF NCRP

- The program area of NCRP works on:
- 2 committee.
- 7 program area committee.
- Advisory panel.

What is advisory panel?

- Advisory Panel is to analyze the mechanism of interaction of non ionizing radiation with biological system include human and to identify biological responses and patient human health.

Role of NCRP

- Protection against radiation, radiation measurement, quantities and units.
- Facilitate effective use of combined resources of organization concern with radiation protection
- Co operative with national and international govt and private organisation.



**Atomic energy regulatory
board (aerb)**

aerb

- The Atomic Energy Regulatory Board(AERB) was constituted on November 15, 1983 by the President of India by exercising the powers conferred by Section 27 of the Atomic Energy Act, 1962
- **CHAIRMAN**:- SHRI. G NAGESWARA RAO
- **HEADQUARTERS**:- **ANUSHAKTINAGAR, MUMBAI**

Mission of aerb

- To ensure that the use of ionizing radiation and nuclear energy in India does not cause undue risk to health and the environment.
- Currently, the Board consists of a full time Chairman, an ex officer Member, three part-time Members and a Secretary.

FUNCTIONS OF AERB

- Develop safety policies in nuclear, radiation and industrial safety areas for facilities under its preview.
- Develop Safety Codes, Guides and Standards for siting, design, construction, commissioning, operation and decommissioning of different types of nuclear and radiation facilities.
- Prescribe the acceptance limits of radiation exposure to occupational workers and members of the public and acceptable limits of environmental releases of radioactive substances.

Cont....

tion,

in x-ray department , the protective
responsibilities of the radiation personnel,
and radiation safety officer (RSO).

- AERB is the authority in India which exercises a regulatory control on the approval of new models of x-ray equipment and the layout of any new proposed x-ray installation.

CONT....

licensing, installation and decommissioning of x-ray
equipment, training of KSO and of service engineers and also
penalties on any person contravening these rules

- The AERB implement the safety provisions by secondary legislation, Atomic Energy (Radiation Protection) Rules-2004, which provides necessary regulatory infrastructure for effective implementation of radiation protection program in India

eLORA(e-Licensing of Radiation Applications)

- eLORA is a web-based I&CT (Information and Communication Technology) application establishing direct communication channel between AERB and its stakeholders for exchange of information and communication transaction.
- A state of art e-Governance system, through automation of regulatory processes associated with the use of ionising radiation in India

Dose limits

- As per Rule 15 of the Atomic Energy (Radiation Protection) Rules, 2001

General Guidelines:-

- The limits on effective dose apply to the sum of effective doses from external as well as internal sources.
- The limits exclude the exposures due to natural background radiation and medical exposures
- Calendar year shall be used for all prescribed dose limits.

APPLICATION	RADIATION WORKER (mSv/year)	PUBLIC (mSv/year)
EFFECTIVE DOSE (BASED ON STOCHASTIC EFFECTS)	30mSv/year <i>Dose of 20 mSv/yr averaged over five consecutive years (calculated on a sliding scale of five years);</i>	1mSv/year
EQUIVALENT DOSE (BASED ON DETERMINISTIC EFFECTS) -LENS -SKIN -HANDS AND FEET	150mSv/year 500mSv/year 500mSv/year	15mSv/year 50mSv/year 50mSv/year
PREGNANT WOMEN	2 mSV after declaration of pregnancy upto term	

N.B : For Trainees, the effective dose in any year shall not exceed 6mSv



Bhabha atomic research centre (BARC)

BARC

- The **Bhabha Atomic Research Centre (BARC)** formerly known as Atomic Energy Establishment.
- India's premier nuclear research facility.
- **HEADQUARTERS:-** Trombay, Mumbai, Maharashtra.
- Founded by Homi Jehangir Bhabha
- Dr. Bhabha established the Atomic Energy Establishment, Trombay (AEET) in January 1954

history

- The Government of India created the Atomic Energy Establishment, Trombay (AEET) with Homi J. Bhabha as the founding director on 3 January 1954.
- It was established to merge all the research and development activities for nuclear reactors and technology under the Atomic Energy Commission.
- After Homi Jehangir Bhabha's death in 1966, who is also known as the "**Father of Indian Nuclear Programme**", the Centre was renamed as the Bhabha Atomic Research Centre on 22nd January 1967.

Cont....

- The first reactors at BARC and its affiliated power generation centres were imported from the west. India's first power reactors, installed at the Tarapur Atomic Power Station from the United States.
- BARC was also involved in the Pokhran-II series of five nuclear test conducted at Pokhran Test Range in May 1998.
- It was the second instance of nuclear testing conducted after Smiling Buddha by India.
- On 3 June 1998 BARC got hacked by hacktivist group milworm, consisting hackers from the United States, United Kingdom and New Zealand. They downloaded classified information, defaced the website and deleted data from servers.



India's first reactor and a plutonium reprocessing facility, Mumbai, as photographed by a US satellite on 19 February 1966.

RESEARCH AND DEVELOPMENT

THERE ARE VARIOUS OTHER AREAS WHERE BARC WORK

- AGRICULTURE - Development of 40 different varieties of high yield seeds through radiation induced mutation
- MEDICAL APPLICATION - 15-20 lakhs patients receiving radiation therapy every year and six lakhs patients undergoing diagnostic investigations.
- RESEARCH IN PHYSICAL SCIENCE - Reactor, ion and electron accelerators lasers and GAMMA RAY ASTRONOMY are being employed as tools for this R&D

objectives

- BARC is a premier nuclear and multi-disciplinary research organization.
- Advanced research and development covering the entire spectrum of nuclear science, chemical engineering, Radiology and their application to health, food, medicine, agriculture and environment.
- It operates under the Department of Atomic Energy(DAE) which is directly overseen by the Prime Minister of India.
- In India, Country Wide Monitoring Devices Like TLD Badges And Film Badges Are Offered By Bhabha Atomic Research Centre (BARC), Mumbai.



**World Health
Organization**

World health organization (who)



Department of who

introduction

- The World Health Organization is a specialized agency of United Nations.
- WHO was established on 7th April 1948.
- The headquarters of WHO is located in Geneva.
- WHO serves as the directing and coordinating authority for International health matters and public health.

history

- First global health organization. In latter half of 19th century, severe cholera epidemics was occurred. At that time, series of international sanitary conferences were held in Europe to co-ordinate policy & practice around quarantine & disease management.
- The League of Nations established a health organization in 1920.

establishment

- Establishment of the United Nations is in 1945, marked as a period of aggressive internationalism & international organization building & though health was not initially thought to be under the U.N.
- After its motion started by Brazilian & Chinese delegates to establish an international health organization and that was generally accepted.

Cont...

- A group of health experts, working on emergency relief in World War II were charged with the task of drafting a constitution to define the structure & mandate of the body that would become known as the World Health Organization (WHO).
- Finally, WHO's constitution came into force on 7th April 1948. This date celebrates every year as "WORLD HEALTH DAY" by all over world.

Objectives of who

- To develop & implement multi sectorial public policies for health, integrated gender- & age- sensitive approaches that facilitate community empowerment, together with action for health promotion, self-care & health protection throughout the life course in cooperation with the relevant national and International partners.

Cont....

- The attainment by all people the highest level of health.
- To lead strategic collaborative efforts among Member States and other partners to promote equity in health, to combat disease, and to improve the quality of, and lengthen, the lives of the all peoples of the world.



World health assembly

functions of assembly

- To determine international health policy and programme.
- To review the work of past years.
- To approve the Budget.
- To elect member state to designate a person to serve for 3 years on executive board.
- Supervises the financial policies of the organization and reviews and approves the proposed program budget.

Who's work

- Prevention and control of specific diseases
- Development of comprehensive health services
- To improve the
- Family health
- Environmental health
- Health statistics
- Bio-medical research
- Assembling of Health literature and information
- Cooperation with other organizations to get the equilibrium in improved health status.

The role of who in public health

- Providing leadership on matters critical to health and engaging in partnerships where joint action is needed.
- Shaping the research agenda and stimulating the generation, translation and spreading of valuable knowledge.
- Setting norms and standards and promoting and monitoring their implementation.
- Articulating ethical and evidence based policy options.

Cont....

- Monitoring the health situation and assessing health trends.
- Providing technical support, catalyzing change, and building sustainable institutional capacity.

conclusion

Although WHO has both opportunities and challenges; Its contribution is great to increase the quality of life and living standard globally

Thank you.....

