

One day theme meeting on measurement of carbon-14 activity in effluent release and environment samples was conducted in AERB on February 19, 2019.

One day theme meeting on measurement of carbon-14 activity in effluent release and environment samples was conducted in AERB on February 19, 2019. The theme meeting was aimed at taking stock of various R&D activities that are being conducted for developing necessary understanding about C-14 activity in environment, in reactor systems, waste disposal facilities including environmental dose monitoring in the areas around NPPs due to C-14. The meeting was also targeted towards harmonization of measurement methods that are adopted by different laboratories with respect to C-14 measurements and identification of necessary further actions.

About 80 participants from various DAE units including BARC, NPCIL, IGCAR, NPPs, ESLs and faculty from Mangalore University attended the meeting. Shri C. S. Varghese, Director, NFRG, AERB welcomed all dignitaries along with the overview of the meeting.



Participants in the theme meeting on February 19, 2019

Chairman, AERB Shri G. Nageswara Rao delivered presidential address. He emphasized on the requirement of a concerted efforts on the issue and follow a graded approach to develop suitable measurement technique, release estimation and to take decision on regulatory oversight on the issue.



Chairman, AERB Shri G. Nageswara Rao delivering the presidential address in the theme meeting on February 19, 2019

In the keynote address Executive Director, AERB, Shri D. K. Shukla brought focus on the purpose of the meeting and identified necessary areas that can be part of the discussion during the meeting. His address touched upon the importance of the required understanding on the overall pathway right from generation of C-14 in reactor system till entry into biota, first level assessment of dose delivered to public and other technical issues related to C-14. Head, DRP&E Shri J. Koley presented vote of thanks and expressed his appreciation to all speakers for their contribution, participant, and to those who were involved directly or indirectly for success of the program.

Total eight studies were presented by various DAE units and Mangalore University (under BRNS project, presented their findings and shared experiences. Major outcomes of all presentations and studies can be summarized as below:

- Environmental concentration of C-14 observed increase during 1963 due to nuclear tests and after that levels have steadily decreased due to mixing with the biosphere and oceans.
- Effective dose to a person due to natural background of C-14 is about 12 $\mu\text{Sv}/\text{y}$.
- C-14 generation in PHWRs is higher than all other types of reactors and maximum part of it generated in the moderator system.
- Significant variations were observed in the data presented by various experimenters on amount of C-14 retained in purification system and that released into environment.
- Cementation of radioactive waste is suitable for keeping C-14 radioactivity confined for long duration.
- Various experimenters used different methodologies for monitoring of C-14 activity.

In the closing remarks Executive Director, AERB emphasized the need for harmonization of sampling methodologies, standardization of sampling protocol, to develop program for monitoring of C-14 activity in reactor system & waste disposal. He also emphasized on the necessary collaborative efforts that are required among the participation organizations to iron out the differences and to arrive at a common understanding. He also advised to collect more experimental data so that outcomes can be studied and reviewed for decision on regulatory oversight on the issues related to monitoring of C-14 radioactivity.

The program was a successful step towards developing understanding about C-14 generation in reactor systems, its pathways to deliver dose to public and to plan the future course of action regarding regulatory oversight.