

**The IAEA's Programme on  
MODelling and DAta for RAdiological IMpact ASsessments  
(MODARIA)**

**S U M M A R Y**  
of the  
**Fourth MODARIA Technical Meeting**  
IAEA Headquarters, Vienna  
9–13 November 2015

This Technical Meeting (TM) was the final meeting of the three year MODARIA Programme, which started with a TM in November 2012. Ten working groups were established under four themes (remediation of contaminated areas; uncertainty and variability; exposures and effects on biota; marine modelling) and these groups also met during this and all of the previous TMs, plus in nearly all cases at interim meetings between the TMs.

For all ten working groups significant progress has been made during the MODARIA Programme, with the majority of the aims and objectives that were initially established being met. From the outset the importance of producing a final report had been stressed and this had been recognized by each of the working groups, with all of them making significant progress towards the final report by the end of the TM. One report was ready for submission to the Agency, most were close to the final editing stage while some needed additional text preparing. However, in all cases there are plans to submit the reports before the middle of 2016. Ideally this momentum should be maintained with publication following as soon as possible after submission. However, the reports are all very long and the length of time required for editing should be recognized. If at all possible it would be helpful for the next programme if at least one of the final reports is published as an IAEA TEC DOC by the time of the first MODARIA II meeting in 2016. Otherwise, it may be hard to convince the Working Group Leaders of the importance of producing their reports in good time. Most of the working groups have also produced papers for the literature and at conferences with a number already published, submitted to journals, or in preparation. This is an important outcome of MODARIA as it ensures the work is widely disseminated, has scientific credibility and publicises the work of the Agency.

The only drawback of the emphasis on producing a final report was that much of the time of the working groups during this TM was taken up with detailed review of the reports or production of text by individual authors. This potentially made it difficult for those people who were attending MODARIA for the first time as there were comparatively few presentations during the working groups for them to listen to. Working Group 2 probably had a bigger attendance than they would normally, as they did have a number of presentations scheduled throughout the week. However, I talked to some new participants from Ireland and the USA and they felt that the week had been very worthwhile. The Plenary Sessions had given them a good overview of the work of all the groups and they found it useful to listen to possible future work plans and to join in with the more detailed discussions in the different working groups. As ever, there is also the problem of people being interested in more than one group, the agendas for each group are given to everyone but there are inevitably last minute changes, which can be frustrating if you go to listen to a particular item and find it was actually dealt with the day before.

An important part of this meeting was the presentation and discussion of ideas for MODARIA II. These had been discussed by the working groups during the 2014 TM and at their respective interim meetings in 2015 and many proposals had been submitted in advance of this meeting and were further developed in the early part of this TM. A Plenary Session was held on Wednesday morning to present

and discuss the proposals submitted. Altogether 17 proposals were received, which reflects the degree of interest in the work and the value that participants attach to the MODARIA Programme. These proposals were discussed under broad headings: marine modelling; exposure and effects on wildlife; biosphere modelling for long term safety assessments of waste disposal facilities; modelling releases to the environment; radioecological data; exposures in urban environments following accidents; remediation and decision making. From the discussions held it became clear that there is great interest in MODARIA II and that people want the working groups to continue. The need for the work to fulfil the requirements of the IAEA and to link to the regulatory requirements and needs of Member States was recognized in all of the presentations. However, it was also clear that much of what was proposed was also of research interest to the participants. A careful balance will need to be struck between ensuring that the programme benefits the IAEA and its Member States as well as maintaining the enthusiasm and active participation of the working group members. There was support for further work on the assessment of the consequences of accidental releases and also for developing models and data applicable to tropical and other types of climate. All of these proposals will now be considered internally within the Agency and a programme developed. One important consideration is the number of working groups, which was discussed during the Steering Committee Meeting attended by Working Group Leaders and IAEA Scientific Secretaries. Although there was a recognition that perhaps 10 groups was too many for logistical reasons (organization of interim meetings, presentations during TM Plenary Sessions, etc.) it became clear that people wished to keep their working group going. For example, Working Groups 8 and 9 which both deal with biota, had discussed merging but concluded that this would not be beneficial for future work. It is clear therefore that 10 is the maximum number of working groups that is feasible.

All previous MODARIA Technical Meetings have always included a Plenary Session with different external presentations. These presentations are of general interest and can help to emphasize the context of the MODARIA work. This year there were two such presentations with one by D. Telleria (IAEA) on the upcoming IAEA Safety Standards for protection of the public and the environment. This was an update of a longer presentation given in 2014 noting that key IAEA Safety Standards for the work of MODARIA were close to publication. The other presentation by L. Bevington of the IAEA's Nuclear Safety Action Team gave an overview of the Report by the (IAEA) Director General and the five technical volumes on the Fukushima Daiichi Accident. This was an interesting summary of the five volume report, which had been published recently, with particular note given of the findings related to the radiological consequences and remediation chapters. He noted that a legacy of the accident was a sharper focus on nuclear safety everywhere in the world and that the IAEA were looking at how to take the findings forward in their work programme.

As at the three previous TMs for MODARIA, there were excellent discussions in each of the working groups with a spirit of openness and collaboration. I am always impressed by the enthusiasm displayed by the participants, a few of whom even attend the meetings at their own expense taking a holiday from their permanent employment. It is also clear that people are sufficiently motivated by MODARIA to continue the work between meetings, taking part in intercomparison and other studies plus writing papers and text for the final reports. Continuing the work between meetings is difficult, due to the pressures of other commitments, but also essential if progress is to be made. It is clear that many good links have been established over the period of MODARIA between scientists working in different parts of the world, plus long standing collaborations have been developed and sustained. These meetings differ from scientific consultancies, or other IAEA TMs in that they enable scientists to not just hear about other people's work but to work together on solving problems, producing output that is relevant and important for all Member States.

Although significant progress has been made during the three year MODARIA Programme there are still outstanding problems of relevance to the regulation and control of radioactivity in the environment. It is therefore important that the work will continue in the next MODARIA II Programme and that the first Technical Meeting for this phase of the programme is already planned for

the week of 31 October – 4 November 2016, which was announced during this meeting. These meetings require significant input from the Working Group Leaders and the Scientific Secretaries for each working group, together with a large amount of logistical and administrative effort required for such a large meeting and the various interim meetings. As chair for the last 3 years I have really appreciated the quality and quantity of the work that is carried out by everyone concerned, which made my task straightforward.

Jane Simmonds  
MODARIA Chair

17 November 2015