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## Editorial

As Arius rapidly approaches its third birthday next month we have much to be happy about. We now have eight Member organisations – a significant step forward in our growth and representation. We are actively involved in a European feasibility study. When international agencies want to consider shared solutions, they come to Arius. Much of this seemed unachievable three years ago. International repositories were regarded with deep suspicion or scepticism by many, or seen as a distraction. Today, with a few exceptions they are regarded as not only essential and inevitable, but also vital for security and the continued implementation and growth of nuclear power – perhaps why they are still so strongly opposed by anti-nuclear groups.

In this issue's topical article, our Director, Charles McCombie, looks back over the successes of the last year or two, and forward, at what is in store. Arius membership covers a large and growing geographical area. The management team, nevertheless, remains a tiny organisation, run from a shared, two-room office on a small budget. But, in carrying the torch for shared solutions, we hope you will agree that Arius has more than efficiently illuminated the issues in the worldwide arena.

*Neil Chapman  
Baden*

## Arius Internal News

### *Assembly of Members, Tengelic, Hungary*

An Assembly of Members took place on 12<sup>th</sup> October 2004 in Tengelic, Hungary, coordinated with the Central European Meeting on Waste Management (see later item). Arrangements for the meeting were assisted by colleagues at PURAM. Arius President, Piero Risoluti, being on duty for the IAEA in South America, could not attend the meeting and the Executive Director, Charles McCombie, chaired the meeting on his behalf.

A key agenda item was the admission of three new Members. ARAO, (Agencija Arao, Slovenia), COVRA, (Centrale Organisatie voor Radioactief Afval N.V., Netherlands) and RDC (Radiation Safety Centre of the Republic of Latvia). Arius now has eight Member organisations as well as a number of individual Members.

The executive presented updates on recent activities, the most significant of which involved further development of international contacts. Key topics were contacts with the new MNA Group formed by the IAEA and the situation concerning Russian proposals for hosting an international repository. These are elaborated in later items in this Newsletter.

The Assembly heard that the first two SAPIERR interim deliverables (legal report and inventory report) had been submitted within the required timescale, and a progress meeting was held with Michel Raynal of the EU the following day in Tengelic. At the time of wiring this Newsletter, the analysis (mainly of the inventory data) is about to start (see later report). SAPIERR had been mentioned and misreported in an EC paper on Creation of a Joint Undertaking for regional waste management. Members were concerned at the circumstances within the EC that had allowed this internal communications breakdown. The ideas behind the Joint Undertaking paper were considered highly premature and the time plan overly ambitious. The AoM agreed that the issue needed a response (and subsequent contacts with the EC have resolved the misunderstandings).

The executive suggested, and the Members accepted the concept of preparing a follow-up proposal to SAPIERR. 'SAPIERR 2' could be extended beyond the current feasibility study on legal aspects and inventory, by looking at other design, operational and safety-related aspects of a shared European repository.

Amendments of the constitution had been discussed at the previous AoM and a proposal circulated for the amended constitution, with comments to every amended article, to the members prior to this meeting. The membership fee of the Member organisations for 2005 was fixed at USD 1000 per year, with flexible further arrangements for funding Arius project work.

For future planning, representatives of Arius plan involvement in several key upcoming activities. The IAEA and the Russian Federal Atomic Energy Agency are organising a conference in Moscow on the Russian proposal to host a repository for international storage and disposal. This may be combined with a further meeting on the same topic to be organised between the Russian and American Academies of



Assembly of Members, Tengelic, Hungary, October 12<sup>th</sup> 2004. Back row, from left to right: Ferenc Takáts (Individual Member, Hungary), Jean Marc Lavanchy (Colenco, Switzerland), Hideki Kawamura (Obayashi, Japan), Charles McCombie (Arius, Switzerland), Gábor Buday (PURAM, Hungary): Front row, left to right: Hans Codée (COVRA, Netherlands), Irena Mele (ARAO, Slovenia), Valentin Stanchev (Kozloduy NPP, Bulgaria), Christina Boutellier (Arius, Switzerland), Neil Chapman (Arius, Switzerland).

Science (see separate News item). The question was raised as to whether Arius should get involved in a Russian initiative. There was no objection to Arius following up the development of the Russian initiative for an "add-on" international repository. It was pointed out that Arius should, however, proceed with caution and avoid giving any false impressions that it is a commercial body focussed on Russia.

Arius should also keep track of other proposals. Kazakhstan has almost reached the point of proposing to host a low level waste repository. This option was favoured earlier by the Austrians, but the IAEA position when approached some years ago by Kazakhstan was not clear. Ultimately the proposal was dropped for political reasons in Kazakhstan. The option might be revived and Arius should stay informed.

About 20 countries will be represented at the 2005 Lawrence Berkeley Laboratory-hosted 'World-wide Review in September 2005. Arius will present the 'international options' paper and will also present contributions at the immediately following International High Level Radioactive Waste Meeting in Las Vegas. Similarly, Arius has presentations at the ICEM meeting in Glasgow, UK, also in September 2005.

The AoM recognised that the Arius activities and those of the Ljubljana initiative should be coordinated, not duplicated. One problem is the different views on time schedule. An important detail is the fact that in the Ljubljana initiative there is a preference for

separating regulators and implementers, whereas the AoM was of the opinion that there need be no separation at present.

Members agreed that Arius needs projects such as SAPIERR to maintain the momentum that has been gathered during 2004. Other consortia, e.g. with Member organisations, would be very valuable. The AoM agreed with this concept but wanted to have each project discussed on a case by case basis.

#### **SAPIERR first deliverables available**

The first deliverables from the SAPIERR project, examining some of the boundary conditions for a possible European regional repository, are now complete.

The detailed review of legal and political aspects (co-ordinated by Christina Boutellier of Arius) and the waste inventory overview that will be used to integrate data from countries with a potential interest in a shared repository in Europe (co-ordinated by Vladan Stefula of DECOM, Slovakia) are both now available for downloading from the SAPIERR website:

<http://www.sapierr.net/>

The Legal Aspects report documents the current legal framework related to the option of a regional solution for storage and disposal of long-lived radioactive wastes. An overview is given of the status of national and international legislation regarding waste transport

and transfer, export and import and the radioactive waste management programmes, including competent authorities and funding. The waste policies of the countries covered in the study are also noted. The legal framework on liability management, which also plays an important role in connection with internationally shared repositories, was excluded from the present study but will have to be looked at in subsequent studies.

The Inventory of Radioactive Wastes report presents the status of nuclear power in Europe and a prediction of its future development, a survey of waste management policies in the SAPIERR countries and estimates of their radioactive wastes arisings. An attempt was made to assess the cumulative inventory of spent nuclear fuel, high-level radioactive waste and other long-lived waste from all SAPIERR countries and its growth in time. Interesting comparisons have been made as to the size of the nuclear industry in individual SAPIERR countries and other EU countries and as to the inventory of spent fuel in the SAPIERR countries and other countries with large nuclear programmes. Other issues, such as storage capacities, national repository programmes and costs of repository development have been also addressed.

The two technical reports on legal aspects and on inventories of radioactive wastes produced by the mid-term of the project are intended primarily as inputs for the subsequent technical report on possible options and scenarios for regional disposal and future RTD recommendations. Despite this, both reports have an added value in addressing issues or aspects not examined before.

One of the essential objectives of the specific support actions is information dissemination. SAPIERR is performing very well in this aspect. The project and its objectives have been presented at numerous international events and always attracted a lot of interest. In addition, a dedicated project web site has been established where comprehensive information on the project can be found. The internet web site has been used during the first year of the project duration only to provide basic information about the project. It is now being expanded by the results achieved so far and its information value will be much higher in the second year of the project. The intention is to maintain the web site beyond completion of the project.

The other essential objective of the specific support actions is definition of areas for future research and technical development. This objective will be covered only in the second year of the project duration. However the essential input data to meet this objective have been collected and analysed, and the two technical reports on inventory data and on legal aspects have been produced.

SAPIERR is now entering Work Package 2, which involves analysis of the data gathered to make a first set of observations on feasibility issues for a shared, regional European repository.

### **Arius discusses with IAEA Multinational Approaches (MNA) Expert Group**

As reported in the last Newsletter, the Multinational Approaches Expert Group (MNA) was set up by Director General ElBaradei of the IAEA in order to advise the Agency on how multinational initiatives could help enhance global nuclear security. The Group is chaired by Bruno Pellaud, ex-DDG for Safeguards, and includes senior representatives from 22 countries. The group will meet 5 times within its year of operation and should present its final recommendations to the DG in early summer 2005.

The topics covered by the Group include all aspects of the nuclear fuel cycle. Obviously, most emphasis is on the especially sensitive technologies such as uranium enrichment and fuel reprocessing. The topics of storage and disposal are also included, however, and, at the 2nd Group Meeting in Vienna, one day was devoted to gathering information and discussing the disposal issue. The discussions were based around two invited 1 ½ hour presentations: the first by Jan-Marie Potier, Section Head in the Nuclear Waste Technology Division at the IAEA, the second by Charles McCombie of Arius.

The presentations were well received and were followed by a total of 3-4 hours of questions, answers and comments. The overwhelming attitude of the Group towards regional or international repository concepts was extremely positive. No negative reactions were given and there were not even any strong reservations expressed – for example, about potential negative effects on national programmes. This point is noteworthy, since opinions were also expressed by participants from countries that have previously reacted very guardedly to the concept. The overall impressions gained were that:

- the Group recognized clearly the security advantages that multinational repositories could provide;
- the importance of making progress by initiating concrete projects was accepted (“Actions not Words” as an overhead title caught their attention);
- the specific proposals put forward by Arius for supporting initiatives in both the “partnering” and the large-host (“add-on”) scenario were judged sensible;
- there is broad support for the IAEA trying, in particular, to progress studies on the Russian option (as has been suggested by DG ElBaradei and was spelled out in more detail in the Arius presentation);
- the final report and recommendations of the MNA Expert Group is likely to contain material directly supporting specific measures to progress the multinational disposal option.

The MNA meeting made it possible to emphasise the need to move ahead by initiating specific project work. The message given by Arius – that both partnering and add-on scenarios must be advanced – was well-received. The specific proposals for studies on the Russian option were also judged to be useful. The Arius presentation stressed the fact that the Russian option will become credible only if a new level of transparency and openness is offered by the Russians and if strict oversight is guaranteed by the international community – in particular the IAEA. This message was very well received by the MNA Expert Group. The thorny question of funding mechanisms was, however, not discussed in any detail.

## International News

### **IAEA Director General again speaks in favour of multinational repositories**

IAEA Director General, Mohamed ElBaradei has been speaking throughout 2004 at many conferences on the urgent need to increase nuclear security and on the necessity of doing so through international cooperation.

The most pressing actions are concerned with keeping control of sensitive, fissile, nuclear materials at the front end of the fuel cycle. However, in his Keynote Address at the Asia-Pacific Nuclear Safeguards and Security Conference on 8<sup>th</sup> November 2004 and in his Statement To the Fifty-Ninth Regular Session of the United Nations General Assembly on 1<sup>st</sup> November 2004, ElBaradei referred directly to IAEA support for multinational disposal initiatives. Most explicit are the following remarks made at the Forty-eighth Regular Session of the IAEA General Conference on 20<sup>th</sup> September 2004:

*"The Agency continues to assist Member States in developing waste management and disposal strategies — and I am pleased to see the renewed interest in multinational approaches to spent fuel management and disposal. More than 50 countries now have spent nuclear fuel, including fuel from research reactors, stored in temporary sites, awaiting disposal or reprocessing. I am encouraged that the Russian Federation has expressed interest in an international approach to spent fuel storage and reprocessing, and has agreed to work with the Agency in giving consideration to its feasibility. We intend to hold a conference in Russia next year to discuss ways of moving forward with international cooperation on such an initiative. ....*

*The concept of multilateral control or oversight over proliferation sensitive parts of the nuclear fuel cycle — specifically, those related to the enrichment of uranium and separation of plutonium — has been the subject of many studies and initiatives over the years. Recent non-proliferation and security challenges make it important and appropriate that we revisit this subject. During the last few months, I have appointed a group of senior experts to look into various options for multilateral control. In my view, the group could focus initially on how to guarantee the supply of technology and fuel for nuclear generated electricity,*

*and how to set up one or more international repositories for spent nuclear fuel. The Agency could play an important role in this regard, particularly as a guarantor of supply, a role envisaged under the Agency Statute. The group plans to submit a report next March on the results of its study."*

### **Further meetings planned on Russian international disposal initiatives**

Towards the end of 2004, informal discussions were held with the IAEA DDG for Nuclear Energy, Yuri Sokolov, and his staff on the subject of planned meetings in Russia on the topic of international disposal. The Russian AEC has requested IAEA help to set up the meeting that was announced by DG ElBaradei after his talks in summer 2004 with the Russian Minister Rumyantsev. Furthermore, the organisers of the proposed scientific meeting on the same subject, to be run jointly by the Russian Academy of Sciences (RAS) and the US National Academy of Sciences (NAS), have also requested IAEA assistance. This latter, scientifically-oriented meeting is intended as a follow-up to the meeting organised in Moscow in May 2003 under the auspices of the private Russell Foundation (this was reported in Newsletter 5).

The current situation concerning the meetings is developing. IAEA staff travelled to Moscow at the beginning of December to advise the Russians on structuring the larger meeting. A programme committee will be established and the meeting will probably take place in early July 2005. The RAS-NAS meeting in Russia will likely take place beforehand, at the end of May; it is proposed to also have a pre-meeting in Vienna.

For Arius, both meetings are important, since the Association is committed to pursuing both of the scenarios for shared disposal facilities described in the 2004 IAEA report, namely "partnering" (as studied in the SAPIERR project) and "add-on" (as would be the case with a large host nation such as Russia).

### **IAEA Technical Committee Meeting on Long-Term Storage of Spent Fuel, Ljubljana October 18th – 21st**

The meeting was organised by the IAEA for participants from Central and Eastern Europe. These, with the exception of Romania, are countries which use Russian origin reactors (VVER and RBMK). The objectives of the meeting were to review the status of interim storage provisions, look at operational problems in fuel storage and to consider the need for cooperative efforts.

Three lecturers were invited: Ferenc Takáts (Hungary) for the first topic, Paul Standring (UK) for the second and Charles McCombie (Arius) for the discussions on cooperative initiatives. The participants from Ukraine, Slovakia, Hungary, Czech Republic, Croatia, Slovenia, Lithuania, Romania and Bulgaria included senior officials from waste management agencies and power companies.

All national participants presented a status review from their countries. The discussions on all topics were very active. Particular interest was shown in the cooperative initiatives part on the two scenarios for shared disposal (partnering or “adding-on” to a major nuclear nation, with the example of Russia being used).

Some surprising conclusions emerged from the meeting. Foremost amongst these was the undisputed fact that providing storage capacity for the next decades is not a problem in the countries participating. The only part exception to this is Lithuania, where new facilities are needed to allow Ignalina NPP to run to its planned (short) lifetime. However, plans for a new storage facility are in place and EU funding is being made available. The relatively comfortable situation in these Central and Eastern Countries contrasts with that in some major nuclear nations (e.g. Japan, USA, Taiwan) where there is a growing and urgent need for extra storage capacity.

The availability of sufficient storage in the participating countries also indicates that there is little or no need for any cooperative initiative for shared storage facilities. Therefore, cooperation in the area of spent fuel storage is to be encouraged mainly with respect to sharing technical knowledge and experience. This is already occurring – the meeting in Ljubljana being itself a good example.

In the disposal area, however, cooperative initiatives that could lead to regional or international repositories would be very welcome- although it was recognised that there is no urgency for implementation of such repositories. Some of the countries (e.g. Hungary and the Czech Republic) are trying to (re-)start serious national geological disposal programmes, so that their interest in shared repositories is part of a “dual track” approach. Some others (e.g. Romania, Slovenia, Croatia) acknowledge that they are too small to support an active deep disposal programme. Emphases are thus on low-level waste disposal and long-term storage.

There was agreement that the shared repository concept should continue to be pursued and that there was value in keeping the interests of the small countries coordinated. This is necessary if the partnering scenario is to be developed further beyond the preliminary studies begun in the SAPIERR project. Coordination between small countries is, however, also important for the case of a potential hosting proposal from a large country. Negotiations would be needed in this case not only over price but also over other conditions to be set – e.g. transparency, oversight, commitment to accept also other non-HLW that requires geological disposal.

### **UK Waste Substitution Issue Finally Decided**

In December, the UK government (Department of Trade & Industry) finally announced that it will authorise the substitution of high-level waste (HLW) for intermediate-level waste (ILW) from BNFL’s reprocessing of spent nuclear fuel from other countries. The amount of ILW that would be retained in the UK is estimated to comprise only ~1.4% of the

national ILW inventory. Substitution involves sending a radiologically equivalent amount of ‘extra’ HLW back to BNFL’s customers overseas. This is ‘radiologically neutral’ in UK terms. The article below, on Italian fuel reprocessing, indicates that at least one potential BNFL customer would like to take advantage of this scheme.

For Arius, the decision sends a clear signal that safety and economic optimisation can be enhanced by rational arrangements involving trans-boundary movements of radioactive wastes.

### **Italian Fuel for Reprocessing Abroad**

SOGIN, the Italian agency responsible for finding management solutions for the national inventory of radioactive wastes, wishes to have 235 tonnes of spent fuel from the defunct power reactors (that have been closed for over 20 years) reprocessed abroad.

BNFL (UK) or Cogema (France) are likely to be asked to tender and could be asked to store the resulting vitrified HLW for up to 20 years, until a national waste disposal solution for Italy is found. Readers will recall the problems encountered by SOGIN just over a year ago when a potential repository site in southern Italy was named precipitately, without prior notifications (see Newsletters 6 and 7). SOGIN is also likely to request that the contractor retains the other reprocessing wastes (see the item above on waste substitution in the UK). BNFL currently stores both uranium and plutonium from previous reprocessing of Italian spent fuel.

## **Conference Reports**

### **Regional conference INLA, International Nuclear Law Association, Celle, Germany, 2-3 September 2004**

The Regional Conference 2004 of INLA was devoted to the topic of “Internationalizing Atomic Energy Law”. It took place in Celle near Hanover and was attended by around 110 participants. These were predominantly from Germany (Government and Industry), but there were also invited speakers from France, Spain, Japan, Italy, UK, Hungary, Belgium and the EC. Christina Boutellier of Arius presented an invited paper on “Problems of an International Repository”.

The first working session was dedicated to legal problems of the management of nuclear waste. In Part 1, “Comparative Aspects”, speakers from France, Spain, Italy, Japan and Slovakia reported on their legislation regarding radioactive waste management and the Arius speaker added legal and political aspects of international repositories.

In Part 2, “International Projects of Radioactive Waste Management in Russia”, different aspects of assistance to Russia were looked at. The second working session was a panel discussion on “Regional Nuclear Safety v. global Nuclear Safety – Do the Europeans need a Complementing EU Nuclear Safety

Regime?”. The 3rd session on “Nuclear Liability and Nuclear Insurance and the 4th session entitled “Current Problems of German Atomic Energy law” were held on the second day and could not be attended by the Arius representatives.

In the session that included the Arius paper, all questions and discussion focussed on the issue of import/export of spent fuel and waste. Almost all participants in the discussion were positive about the advantages that can result from shared repositories. The only direct criticism came from a representative of the German foreign ministry, who asserted that this was a moral issue since there were no volunteer countries at present for an international repository. His argument was countered by Arius, pointing out a) that the multinational approach can only succeed if volunteers do come forward in time and b) that (with only very few exceptions) national programmes do not normally use a volunteering approach.

The German speaker was also directly contradicted by a representative of the German nuclear industry who pointed out the global advantages of ensuring that state-of-the-art, safe and secure repositories are made available to all nuclear countries, however small, and gave his opinion that this was a more “moral” approach than that being taken by Germany.

The INLA meeting provided a useful opportunity for Arius to observe the reactions of the predominantly legal audience to shared repository issues. The Arius paper will be published in the book of proceedings.

### **WNA Symposium, London, 6<sup>th</sup>-9<sup>th</sup> September**

The WNA Symposium in London was attended by around 450 participants, from all branches of the nuclear industry. The symposium is the prime event for commercial nuclear organisations, as witnessed by the numerous bilateral meetings held in parallel. Also coupled to the symposium are the half-yearly meetings of the various working groups of the WNA. Arius is also a member of the WNA Waste Management and Decommissioning Strategy Group.

The bulk of the presentations at the Symposium were concerned with the front-end of the nuclear fuel cycle. However, good opportunities were also provided for the Arius representatives to make useful contacts for promoting the objective of progressing concepts for multinational facilities. In particular, the topic was briefly discussed with Hans Blix (ex DG of the IAEA and a long-time supporter of multinational approaches) and with Loyola de Palacio (then Vice-President of the EC and initiator of the Waste Directive) and with representatives of the nuclear press. In addition useful new contacts were made to organisations from countries that have a direct interest in shared repository solutions.

The Arius paper entitled “Nuclear Fuel Cycle Centres – an Old and New Idea”, which was outlined in the previous Newsletter, had already had a good reception before its presentation. An advanced copy was sent to the IAEA and this resulted in the Agency requesting permission to put the paper onto their new

website devoted to multinational approaches. See:

<http://www.iaea.org/NewsCenter/Focus/FuelCycle/ind ex.shtml>

The paper was presented to the plenary session of the Conference on Friday morning. A series of positive comments were made by attendees following the presentation. The WNA also made fuel cycle centres the main topic of a subsequent issue of their Newsletter, making reference to the Arius paper.

## **Topical Article**

### **Three Years Old and Growing**

*by Charles McCombie*

Arius has almost completed 3 years of operation since our foundation in February 2002. What has been achieved in this time? What are our goals for moving initiatives on multinational repositories forward from the concept phase towards concrete programmes aimed at the realisation of projects leading to shared disposal facilities? In this first Newsletter of 2005 we address these questions briefly.

#### **Continuous growth in support**

Many countries, especially those with smaller nuclear waste inventories, clearly recognise the potential benefits of shared repositories. Nevertheless, it was not easy in 2002 to initiate an international group of organisations that would formally and openly support an official self-help association like Arius. The principal reservations resulted at that time from the pressures exerted by some advanced national programmes that feared their siting efforts could be disturbed by debate on international repositories. Nevertheless, the six founding Members of Arius publicly supported the concept and provided the finances necessary for central coordination through the office in Switzerland.

Growth in the organisational Membership of Arius has not been rapid. Three new Members have joined, one has dropped out for financial reasons, and discussions are still underway with a few further candidates. The growing acceptance of the multinational repository concept has, however, been clearly demonstrated by the involvement of a much larger number of countries and of international organisations in the project work of Arius. Most notable here is the SAPIERR project, with support of the EC and the Swiss Education and Science Ministry. Organisations from 14 countries are cooperating in a pilot project to study the option of regional repositories in Europe.

In addition to the support of the EC, Arius has been greatly encouraged by the clear position taken by the IAEA on the topic of multinational repositories. Not

only has the Agency published (with considerable input from Arius) an official TECDOC on the subject, it has also been supportive in other ways – for example, inclusion of the issue in various IAEA conference contributions. Most prominently, however, the position of the IAEA is reflected in the numerous public statements of its Director General on the potential safety and security aspects of multinational repositories.

An important reason for the increasing recognition of the value of multinational facilities is that they can have significant security benefits. The tragic events of 2001 illustrated all too clearly that terrorists will stop at nothing – and thus made very clear that all fissile and radioactive materials must be kept under close control. The security concerns of many nations will continue to be a driver for gathering all such materials into closely controlled storage and disposal facilities.

### **Why has support grown?**

The security issue is one of the most prominent reasons for the increased interest in multinational repositories. There are others, however. The reservations, or even opposition, expressed by some larger countries have dropped off as these countries have moved ahead successfully with their national siting programmes, with no obvious obstacle being presented by the existence of multinational concepts. The necessity for small countries to consider their future disposal options was emphasised when many such countries joined the European Union, which required long-term planning in radioactive waste management. The EC itself recognised that regional repositories may be the only feasible option for some countries, and this was the justification for EC support of the SAPIERR project.

We believe, however, that a significant contribution to the increased support of multinational concepts over the past few years has, in fact, been the activities of Arius itself. At a large number of conferences, arguments for multinational options have been put forward by members of the Arius Executive, and also by persons from within the Member organisations of Arius. To be specific, Arius has been reported at almost twenty conferences and meetings over the past three years. Some of these contributions have led to prominent publications in nuclear journals. Arius is increasingly recognised as the competent body in this area and has been invited to put the case for shared disposal concepts on many occasions – most recently to the Multinational Approaches (MNA) Expert Group established by the IAEA.

### **How can we progress further?**

Arius has made significant progress, but it is important that this continues. This does not imply that a multinational repository must be, or can be, implemented in the near future. One need only look at the long timescales needed to progress purely national disposal programmes to realise that the still greater challenges in a multinational approach will not

be mastered in a few years. Continuing progress for Arius means that the circle of direct supporters grows and that we move towards the initiation of concrete multinational disposal programmes that parallel the national repository projects, with almost all of which Arius has already established a complementary, mutually supportive relationship.

The prospects for this are good. Two basic scenarios that could lead to shared repositories have been defined by the IAEA and Arius is directly involved with both approaches. The first is the “cooperative scenario”, in which a number of generally small countries collaborate to identify siting possibilities for one or more shared repositories within their combined territories. The SAPIERR project has started down this avenue. Another development, the Ljubljana initiative, considers the same approach and Arius has good contacts to the group of contiguous Central and Eastern European countries involved in this initiative.

The second main IAEA scenario is the “add-on” option, which involves one, generally large, nuclear programme accepting wastes for disposal from other countries. Various large countries have been suggested as potential hosts, but the most realistic prospect at present is Russia, where the Government favours consideration of hosting an international repository. Here Arius also keeps a finger on the pulse. Arius staff were involved in the 2003 meetings in Russia on this topic and intend also to participate in the two meetings planned in Moscow in 2005, as described elsewhere in this Newsletter.

Given the long timescales to implementation of geological repositories, Arius members believe that it is sensible at present to keep options open. These options for most Members include not only the multinational IAEA scenarios described above, but also a national facility, if cooperation does not succeed in the coming decades. Pursuing such a dual- or multi-track option does not require huge levels of effort in the current study phase. The costs of geological repository programmes rise sharply only when specific field explorations begin – and much more so during construction and operation. By cooperating during the study and planning phases, Arius Members can hope to reduce the resources each will need later to develop shared facilities.

Even for the study phase, however, resources will be required beyond those currently available to Arius. The association has made real progress even with its limited budget to date. Some of this progress, however, was based on existing knowledge and material as Arius was formed. Moreover, the effective budget has been very significantly reduced during the past year due to the drastic fall in exchange rates for the US dollar, the currency that was unfortunately chosen for contributors. To maintain momentum it is necessary to increase our activities at Arius. An important goal for 2005 is therefore to add additional Members. We hope that the success story to date, as outlined above, and the specific opportunities offered

in 2005, will convince further Members to join our association.

## Upcoming Conferences

This section of the newsletter highlights upcoming conferences that are specifically relevant to Arius activities and objectives. Those at which Arius is attending or presenting papers are indicated.

### January

**26<sup>th</sup> – 28<sup>th</sup>:** INMM Spent Fuel Management Seminar XXII, Washington DC, USA

### February

**27<sup>th</sup> – March 3<sup>rd</sup>:** WM 2005: Waste Management 2005, Tucson, USA

### March

**16<sup>th</sup> – 18<sup>th</sup>:** Global Directions for the Future: international conference on nuclear security, London, UK

### May

**20<sup>th</sup> – 24<sup>th</sup>:** Asia Oceania Geosciences Society Conference, Singapore

### July

**13<sup>th</sup> – 17<sup>th</sup>:** NUSEC – Nuclear Energy and Security, Salzburg, Austria

### September

**4<sup>th</sup> – 8<sup>th</sup>** Tenth ASME ICEM International Conference On Environmental Remediation And Radioactive Waste Management , Glasgow, Scotland  
*(Arius paper)*

**12<sup>th</sup> – 15<sup>th</sup>:** MRS 2005: 29<sup>th</sup> Symposium of the Scientific Basis for Nuclear Waste Management, Mol, Belgium

**18<sup>th</sup> – 23<sup>rd</sup>:** Migration '05: 10<sup>th</sup> International Conference on Chemistry and Migration Behaviour of Actinides and Fission products in the Geosphere, Avignon, France

**24<sup>th</sup> – 25<sup>th</sup>:** Geological Challenges in Radioactive Waste Isolation: 4<sup>th</sup> Worldwide Review, Berkeley, USA.  
*(Arius paper)*

**25<sup>th</sup> – 30<sup>th</sup>:** International High-level Radioactive Waste Management Conference, Las Vegas, Nevada  
*(Arius paper)*

### October

**3<sup>rd</sup> – 7<sup>th</sup>:** Safety of Radioactive Waste Disposal, IAEA Conference, Tokyo, Japan

**9<sup>th</sup> – 13<sup>th</sup>:** GLOBAL 2005, Tsukuba, Japan

### November

**7<sup>th</sup> – 8<sup>th</sup>:** EUROSAFE 2005, Brussels, Belgium

### October 2006

**15<sup>th</sup> – 20<sup>th</sup>:** 15<sup>th</sup> Pacific Basin Nuclear Conference, Sydney, Australia