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Editorial

Summer has seen a major and much hoped for development for Arius: the successful navigation of the SAPIERR project through the proposal evaluation and acceptance processes at the European Commission. Working closely with DECOM, Slovakia, we are now at the final contract negotiation stage which, if successfully completed, should see the launch of this extremely important, two-year project already before the end of this year.

The political and technical significance of SAPIERR should not be underestimated. We have moved from a position only a couple of years ago when even the discussion of international options was problematic for some countries. Now we are on the brink of a first European feasibility study with wide support. SAPIERR represents only the first steps, and it will be some time before all the elements necessary to begin thinking about how a European regional storage or repository facility might be implemented are assembled – but it represents a sea change in European thinking that may well have impacts in other regions of the world.

Owing to our current strong focus on getting SAPIERR right, and on preparation for our upcoming Assembly of Members, the newsletter for September is less extensive than usual and we have not included a Topical Article this time – but watch out for our next issue, which will begin to look at the issue of shared long-term storage.

*Neil Chapman
Baden*

Arius Internal News

Annual Assembly of Members

The second annual AoM will take place in Baden, Switzerland on October 14th 2003. Important items on the agenda will be financial planning for 2004, membership growth and membership models for the future, and, of course, plans for the implementation of SAPIERR.

Arius joins ITC School of Underground Waste Storage and Disposal

In August, Arius applied for membership and was elected to the ITC School of Underground Waste Storage and Disposal. Like Arius, the ITC (www.itc-school.org) is an Association, with a broad membership, and is based in Switzerland. The aim of the international School is to propagate knowledge to future generations of scientists, engineers and decision-makers who will be involved in managing or evaluating projects aimed at storing or disposing of hazardous wastes in underground facilities. The School provides both theoretical and practical training and research in all aspects of science, engineering, decision-making and communication concerned with underground waste management and related environmental issues. It is linked directly to active underground experimental facilities, in particular, the Grimsel Test Site. It is able to provide professional training at all levels, ranging from academic courses and modules in association with universities around the world, to summer schools and retreat facilities for think-tanks and policymakers.

The ITC is independent of any sector and provides educational services to industry, regulatory agencies, academia and government bodies. The Association was founded in April 2003 and currently has a membership of more than 40 organisations worldwide that are committed to the objective of ensuring that training facilities are provided for the future. The School will give its first course entitled “*The Fundamentals of Geological Disposal & the Theory and Practice of Underground Rock Facilities*” in October 2003, in collaboration with the IAEA and CEN.SCK. A programme of six to seven courses in radioactive waste management is being developed for 2004.

Like many other organisations, Arius believes that the propagation of knowledge, skills and experience on waste storage and disposal is vital, given the long and frequently fragmented timescales of waste management projects – characteristics that are equally likely to apply to both national and multi-national initiatives over coming decades.

The ITC held its first Assembly in early September, and Arius was represented by Christina Boutellier. Quite apart from supporting the ITC aims, it was clear that there are several practical areas where the two Associations could assist each other. Already at the first ITC course, the international team of lecturers includes persons from Arius.

SAPIERR passes the EC evaluation tests

The proposal for the SAPIERR project (Support Action: Pilot Initiative for European Regional Repositories) was positively evaluated and accepted

for detailed contract negotiations by the expert evaluation panel of the European Commission at the end of July, to be part of the 6th Framework Programme. The project was developed by Arius, working together with Decom, Slovakia, who submitted the proposal and will be the official Project Coordinator.

The following summary describes the scope of the finally agreed project. Some small nuclear power programmes in the expanded EU may not have the resources or the full range of expertise to build their own repositories for long-lived radioactive wastes. Even for countries that could potentially implement national projects, there are environmental and economic advantages in co-operation. The prospect that countries could work together to explore regional solutions is raised in the draft of the EC radioactive waste Directive. Such solutions raise new trans-national issues of safety and governance, not so far addressed by national programmes in the European research area: nuclear security, safety of multi-user repositories with diverse waste types, national and European public acceptability, trans-boundary waste transport and national and European economics and law.

SAPIERR is a pilot initiative to help the EC to begin to establish the boundaries of the issue, collating and integrating information in sufficient depth to allow potential regional options to be identified and the new RTD needs to be scoped. Possible future programme components and structures will be suggested. SAPIERR will bring together Member States and Candidate Countries wishing to explore the feasibility of regional European solutions. Specific proposals for regional facilities, including potential siting are not part of this initial pilot study. The work is aimed at establishing the boundary conditions for such collaboration and the implications in an enlarged European Community. The development of a geological repository is a very long-term project with an overall duration of decades. Given the rapid geopolitical development in Europe, the socio-political opposition to multinational repositories that is observed in some countries today may well have been overcome by the time of actual construction, and the environmental and economic advantages of these solutions may prevail over the political problems. The work will:

- develop a collaboration framework and initial components of a database for regional waste management in the EU
- identify amounts, types & times of arising of relevant wastes (all waste requiring the geological disposal will be considered, but the emphasis will be on spent nuclear fuel and high-level waste)
- identify possible concepts for European regional storage & disposal
- identify the main safety & governance implications raised by these concepts, and propose priorities for future studies
- examine whether there are new, trans-national RTD requirements

- propose mechanisms for developing strategy options & RTD needs in future EU programmes.

The work will involve a working group of interested countries, data gathering and analysis, and reporting of findings at an international seminar and to the EC.

Work Packages: The main technical work packages in SAPIERR are as follows:

WP1: Data gathering & analysis

Gathering and analysis of data and views from countries interested in regional solutions together with review of the existing information from other EC programmes such as COMPAS and 5th report on the situation on radioactive waste in the EC, and from the IAEA database. Compilation of legal policy requirements in the same countries and more widely in Europe.

The consortium technical staff will immediately start collecting the existing relevant information from the sources such as past framework programs, European Commission summary reports, and IAEA documents. Consultations with the EC staff early after commencement of the project will allow us to acquire the latest information from the EC database and to discuss the proposed range of information to be gained from the working group. Once the Working Group (see below) has been established in WP3, it will assess the scope of the above information and suggest ways of accessing the information in each country. The consortium technical staff will work with the members of the working group to identify and obtain the information. The sources, volume and quality of data will then be assessed and the information will be analysed so that it can be used to identify possible options and scenarios for shared solutions and their implications under the broad headings of safety, governance, economics, legal aspects and in particular future RTD needs (in WP2).

At the end of the exercise, the two separate technical data reports will be compiled and published on the dedicated internet site. These two reports will be a compilation of gathered information on:

- inventory of radioactive waste in terms of amounts, types and times of arising from individual countries, social and economic aspects of shared facilities;
- legal aspects of the shared disposal option looking at the current status of national legislation in relevant countries regarding waste transport, export/import, liability management, national and European radioactive waste policy.

WP2: Scenarios & RTD requirements

This involves the identification of options and scenarios for regional co-operation and the development of possible future European RTD programme strategies that would allow these options and scenarios to be explored in the future. The information gathered in WP1 will indicate some of the main boundary conditions that would have to be met if a regional solution were to be developed.

SAPIERR Programme plan in quarter years		(D = Deliverable number)							
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
WP1	Info gathering and analyses								
	Waste data				D1				
	Legal data				D2				
WP2:	Scenarios, RTD requirements								D3
WP3:	Working Group								
	Meetings		D4						D4
	Virtual Working Group								
WP4:	Information dissemination								
	International seminar								D6 D7
	Internet/web-site		D5						
WP5	Consortium Management								D8
Deliverables D1, D2, D3 are task reports									
Deliverable D7 is the Seminar Proceedings; Deliverable D8 is the final project report									

Further relevant issues concern safety, governance, and economics aspects. Governance includes broad political and social dimensions. First consideration of all such aspects, combined with information on waste amounts, arising rates and location, will be used to define a set of possible regional repository options and the scenarios that would lead to consideration of these options. The identified options and scenarios will be in outline form only. If any of these is to be looked at in detail in the future, substantial gaps in knowledge and information are likely to be encountered; this will make feasibility studies difficult. WP1 will have identified what these gaps are. WP2 will clarify the RTD requirements to fill the gaps and suggest ways of formulating future European research area programmes to carry out the work efficiently.

The analytical work will be performed by the technical staff of the consortium but the Working Group will provide feedback and comments by e-mail before the report on this topic is released. A second meeting with the EC to will be held towards the end of this workpackage in order to establish the best way to frame the recommendations and the policy scope within which to structure them. A technical report on possible options and scenarios of regional disposal and future RTD recommendations will be produced at the end of this WP.

WP3: The SAPIERR Working Group

Organisation of a workshop and maintenance of a "virtual Working Group". The workshop will help to clarify the types of data that can be provided for SAPIERR. The Working Group will provide data and review the preliminary resulting database. The Working Group will be established at a meeting (workshop) which will be held soon after commencement of the project – probably in month 3. The workshop will be held in Trnava, at the headquarters of DECOM, Slovakia. Following the workshop, the Working Group will continue interacting on the basis of e-mail and internet communication. It will supply information needed in WP1 and review the outputs of WP1 and WP2. Members of the Working Group will get together again at the final international seminar – see WP4.

WP 4: Information dissemination

This key task is the dissemination of information to all interested parties throughout the project and of the overall findings at the completion of the project. The primary mechanism is organisation of the international open seminar on the conclusions of the project and proposals for further studies. A dedicated website, linked with the ARIUS site, will be set up to provide access to the project goals, structure, objectives and progress. This will be regularly updated and will be freely accessible. All project reports, after approval by the Working Group, will be made available as downloadable objects.

At the end of the project, DECOM and ARIUS will host a two-day international seminar at which the results will be presented for open discussion to any interested participants. This event will most probably take place in Brussels. One of the countries participating in the working group is another possibility. The meeting will also include invited presentations from interested EU and non-EU countries on the topic of regional solutions. The meeting will be widely advertised and open to all interested parties even beyond the existing Working Group members.

International News

Arius again a guest at the Slovak-Czech Seminar on Radioactive Waste Management Issues

Following its 2002 invitation to the Czech-Slovak waste management meeting in Straznice in the Czech Republic, Arius was invited again to participate in the 2003 Seminar, this time held on 26th and 27th August in the spa resort of Piestany in Slovakia. The first part of the meeting was a celebration of the 10th anniversary of Decom, Slovakia, Arius's partner in the SAPIERR proposal described above. The meeting was attended also by representatives from other countries (including, Austria, Hungary, Italy, Slovenia, UK) and the decision was taken from 2004 to re-title the event as a "Central European seminar" and to hold this next meeting in Hungary.

An interesting component of the meeting was a panel discussion on multinational or regional repositories. This was introduced by an Arius talk and led to a list of conclusions on this subject being agreed by the participants. These conclusions, could be summarised as follows:

- a) For countries with small nuclear programmes or limited resources a "dual track" approach to HLW/SF disposal is appropriate. This involves pursuing the option of shared disposal in parallel with building and maintaining know-how that would be required for a national solution.
- b) Participants at the meeting agreed that it was important for central European countries to support regional initiatives such as that promoted by Arius. Support for Arius was widespread in the scientific and technical community. Nevertheless, the provision of adequate funding was a problem for some very small programmes and the need to increase political level support was an issue in some others.
- c) The SAPIERR project submitted to the EC by Decom and Arius was judged by all participants to be a valuable initial step worthy of wide support.
- d) It was agreed by participants that regional and national repositories should be complementary facilities in Europe. It is the prerogative of any state to choose a national solution and some will do so; these may also show the way ahead to successful implementation. For others sharing of regional repositories will be essential.
- e) At a purely technical level, it would be valuable to establish regional working groups in the key areas of importance for geological disposal. One example is the area of repository performance assessment.

All participants were keenly interested in the possible consequences of the European Waste Directive, the status of which was described in detail by Viteslav Duda, the Head of the Czech waste management programme.

Russian and US National Academies Workshop on "Problems of Managing Spent Nuclear Fuel and Selection of a Site for Its Storage", Moscow May 2003

A special meeting was organised in Moscow under the auspices of the private Russel Foundation between the Russian Academy of Sciences (RAS) and the American National Academies (NAS) on the subject of international storage and disposal in Russia. Charles McCombie was invited by the NAS partly because of his current position as Vice-Chairman of the NAS Board on Radioactive Waste Management and partly because of the recognition of Arius work on international options. The meeting gave a clear picture of Russian views on the future of nuclear power, on strategies for developing new back-end treatments and on the status of their international plans.

Of particular interest for Arius is the current position of Russia concerning import of foreign spent nuclear fuel. The Russian situation is at present important internationally not because any specific import programme is expected to be implemented on a short timescale but because it demonstrates that potential volunteer nations for multinational repositories do exist. In this respect, some observers have questioned whether the Russian expression of interest extends beyond the Government officials at Minatom and includes other parties in Russia - and in particular potential host communities.

It was therefore valuable that the visit provided extensive opportunities to observe the position taken by scientists in the Russian Academy and in research organisations and also by one specific potential host community. Following the Workshop, the small group of foreign scientists and engineers was invited ad personam under the auspices of the RAS to visit the city of Krasnokamensk in South East Siberia, close to the Chinese and Mongolian borders. Krasnokamensk, a former closed city and the location of uranium mining and extraction activities, has been suggested by Russian officials as a potentially suitable site for international storage/disposal. This article records details of the facilities visited and the extensive discussions with the senior staff of the operating company as well as brief meetings with local political leaders.

The non-Russian participants at the meeting were chosen for their expertise in the nuclear fuel cycle (storage, transport and disposal) and in transmutation. The US Co-chairman was Milt Levenson formerly of Argonne, EPRI and Bechtel. The Russian delegation was of a very high level, chaired by Nicolay Laverov, who is Vice President of the RAS and a former Deputy Prime Minister of the Russian Federation. Other high level officials were among the 40-50 Russians that attended; these included Prof. M. Solonin, currently first Deputy Minister at Minatom. Alexei Lebedev (Deputy Director General of Tenex) V. Lebedev (ex-Minister, ex head of Krasnoyarsk) and V Ivanov (ex 1st Deputy Minister at Minatom)

The entire proceedings of the Workshop will be published in English and Russian by the NAS. Some key issues that were raised by several speakers are noted.

- Russia does not classify spent nuclear fuel as waste. The firm intent is to use a closed nuclear fuel cycle and new facilities including dry stores and an advanced reprocessing plant are planned.
- The Russian word for storage and disposal is the same so that confusion concerning end objectives can easily arise. The confusion, however, is not only semantic since there is also a tendency to avoid the related sensitive issues concerning the import of spent nuclear fuel.
- The 2001 change to the Russian Law allows import of spent fuel for storage and for reprocessing. Amendments have apparently been made that specify that reprocessing is "with predominant return of wastes". This is interpreted

to mean that non-return of wastes is allowed under certain conditions. The RAS agreed to supply texts of the laws. Currently, import to Russia of HLW is not allowed.

- Two potential sites for storage (and possibly disposal) of imported SNF are considered: one at Krasnoyarsk and one at Krasnokamensk. Minatom appears to favour the former (since the reprocessing plant RT2 will be there); the RAS appears to prefer the latter (where the only existing nuclear activities are uranium mining, milling and extraction).

The conclusions together with all papers presented will be published by the NAS. Essentially the Workshop was a further step in the Russian strategy of making known its interest in importing spent nuclear fuel as part of its ambitious nuclear programme.

Following the workshop a visit to the city of Krasnokamensk was organised by Nikolay Laverov, Vice president of the Russian Academy of Sciences. Foreign participants were Milt Levenson, Sekazi Mtingwa from MIT, Koji Nagano from Japan and Charles McCombie, accompanied by Chelsea Sharber of the US National Research Council and Vladislav Petrov, Secretary of the Scientific Council at the RAS. The site at Krasnokamensk, together with the alternative of Krasnoyarsk are the two sites that the Russian Ministry, Minatom is considering offering as storage and disposal sites for foreign spent nuclear fuel. The Russian Academy invited the group to Krasnokamensk in order that the advantages of the site and the location could be explained.

Krasnokamensk was in Soviet times a "closed city" with effectively no access possible by outsiders (foreign or Russian). In contrast to other closed cities, however, the only parts of the nuclear fuel cycle carried out there are mining, milling and extraction of uranium. Accordingly any contamination by radioactive materials is similar in type to that caused by such activities wherever they take place. There has been discussion about the degree of contamination around the site. A Greenpeace group has claimed it to be very contaminated whereas a group from the Radiation Protection Institute in Sweden found nothing exceptional. Another striking feature about Krasnokamensk - and the "Combine" (Priargunsky Industrial Mining and Chemical Union) that runs all operations - is that they are remarkably self sufficient, with a developed infrastructure. This was necessary because Krasnokamensk lies about 600 km SE of Chita and Chita is on the trans-Siberian railway 6300 km E of Moscow and 3800 km west of Vladivostok.

Today, Krasnokamensk is an open city of about 60'000 persons, poor by Western European standards but spacious, orderly and well managed compared to most other Russian cities. The Combine is now a Joint Stock Company, with 38% belonging to Minatom, 38% to TVEL (the Russian fuel manufacturer, also belonging mostly to Minatom) and the rest in private hands, including those of present and past workers. It employs 20,500 persons and operates the following facilities:

- an open pit coal mine
- an open pit uranium mine
- underground uranium mines
- an uranium milling and extraction plant
- a 400 MWe coal fired power station
- a well equipped factory capable of maintaining and even manufacturing most of the equipment of the Combine.
- a transport service including local rail connections and rolling stock.

In addition, the Combine is effectively in control of many city activities, reflecting the former times, when the General Director of such a closed city operation was normally also the mayor.

The Krasnokamensk Combine was always fairly autonomous in its actions and now is to a large extent independent. The General Director (Valery Golovin), with whom the Group met twice, and his staff were all highly motivated to try to establish activities that would offer Krasnokamensk opportunities 10-20 years in the future, as the uranium ore becomes worked out. That is a prime motivation for their interest in possibly hosting spent nuclear fuel (SNF) in storage and disposal facilities. The group was given full access to information and to the facilities, being escorted in turn by the Chief Scientist, the Chief Geologist and the Chief Production Engineer. Following the facility visits and a presentation by the Chief Geologist on the potential site for SNF, the group gave its comments and impressions which were on the following lines:

- First, the group pointed out clearly that they were participating and commenting as individuals and not as representatives of their countries of origin or for the US National Academies.
- Visiting the mining facilities made it obvious that the capability for excavation of underground waste facilities was available in Krasnokamensk.
- The comprehensive technical infrastructure and engineering capabilities indicated that capabilities for handling, transfers and even container fabrication could be established, even though significant upgrading to nuclear standards would be needed.
- The siting studies to date had identified promising granitic domes very close to the site (15-20 km). However, project studies had concentrated upon planning storage caverns. More work is certainly needed to develop concepts for storage and disposal and to establish the suitability of the geological environment. In the arid, hilly region with its low water table, a horizontally accessed storage cavern in unsaturated granite may be combinable with a deep disposal facility down in the chemically reducing zone below.
- The enthusiasm of the leadership of the Combine and the reported lack of "radiation phobia" in the City are obviously positive assets. The fact that the Combine staff was not exaggerating the positive attitude was demonstrated by friendly

discussions between the Group and the President of the regional parliament (Duma) and the Deputy Governor of the area, following a chance meeting at Chita airport.

- The remoteness of the location means that transport distances would be large. However, rail connections exist in all directions, and in particular to the port of Vladivostok, which is convenient for potential customers in SE Asia.
- Critical actions that must be fulfilled if the feasibility of siting at Krasnokamensk is to be investigated further include:
 - clarification of the overall concept for storage, reprocessing and disposal (Russia still refused to consider disposal of SNF because it is seen as a resource; some countries may wish to dispose of SNF; Russia currently will not accept HLW for disposal; the USA will not allow transfer of SNF or storage unless a route to disposal exists);
 - Investigation of the site characteristics, most usefully in open studies that involve also international experts;
 - spreading in the international technical and political communities the messages that Krasnokamensk is potentially a willing host for an international facility, that a well organised, experienced work force is available there, and that open cooperation with experts from other countries would be welcomed.

Overall conclusions: Both components (NAS-RAS Workshop and Krasnokamensk visit) provided valuable insights into the status of the Russian nuclear fuel cycle. They also enabled useful and informative contacts to be established important figures in the scientific, business, and political arenas. The Russian Government is obviously very committed to expanding its nuclear programme; it is ironic that some of the funding for this will derive from revenues from selling Russian natural gas to European countries that are intent on reducing or removing their nuclear capacities.

Russia is also intent on becoming an even bigger provider of nuclear fuel cycle services internationally, including Uranium supplies, enrichment, fuel fabrication and reprocessing. The issue of whether reprocessing services can be offered without return of wastes is still sensitive. It appears to be possible for Russian origin fuel, but not (yet?) for foreign fuel. Acceptance of existing foreign waste for disposal is not allowed, and there was no apparent interest in promoting such a course.

If Russia were to be able to provide a service to small foreign countries, several issues would have to be addressed, including the following:

- A reprocessing service with return of wastes does not appear attractive; this service is already offered by France and the UK and is generally regarded as uneconomic by potential customers.

- Acceptance of spent fuel with no return of wastes would be attractive for countries such as Taiwan that have a growing inventory of spent fuel and no other options at present. For countries that already own HLW from reprocessing or any other wastes that require geological disposal, sending future arisings of spent fuel to any multinational facility is of limited appeal if it does not remove the need for national repositories.
- Before becoming a truly credibility candidate for a multinational facility, Russia would need to raise the level of trust that potential partner countries and international organisations have in potential Russian disposal projects. This would require greatly increased levels of transparency and control – both of which may, in fact, be acceptable to the Russian authorities.
- In a country with the vast size of Russia and the proven technical capabilities, it is obvious that a state-of-the-art repository programme could be implemented, given sufficient societal and financial support.
- Today, for those who believe that multinational facilities must eventually be implemented to assure global safety and security, the Russian initiative may be positive, even if it does not lead to a shared repository in the future. The simple fact that the Government, the technical community and at least one local community is willing to consider hoisting a shared repository may encourage others to express an interest.

An interesting further development is that an open paper by the Russian proponents of Krasnokamensk as a potential storage or repository site will be included in the special session at the Tucson 2004 Conference that is described elsewhere in this Newsletter.

Developments on Multinational Repositories at the IAEA

Three significant developments have occurred over the last months:

- the completion of a draft Technical Report on multinational disposal concepts;
- accelerated evaluation of the security of spent source disposal, which has potential implications for shared facilities;
- the speech of the Director General to the 2003 General Conference of the IAEA in September.

Further report on multinational repositories: The new report, entitled 'Developing and implementing multinational repositories' was discussed at a meeting in Vienna in September of this year. Although the emphasis is on spent nuclear fuel and high level waste, the report covers multinational disposal of all kinds of radioactive wastes, recognising that waste streams such as low-level wastes and spent sealed sources may also be disposed of in multinational facilities. A 'history' section demonstrates that such concepts are not new and that there has in the past been significant transfer of wastes for disposal in another country. Three 'sharing' scenarios are

considered: a large nuclear country accepting waste from smaller programmes on an 'add-on' basis; small countries joining together because they do not have the capabilities themselves to implement a deep repository; countries joining up, not because they cannot implement national solutions but because they are aiming at economic and environmental optimisation. The report lays out the benefits challenges and requirements for all stakeholders – host country, partners and third parties. Emphasis has been placed on the key challenge of achieving adequate acceptance of the concept at political and public levels.

The IAEA has already produced in 1998 a report (Technical, Institutional and Economic Factors Important for Developing a Multinational Radioactive Waste Repository, IAEA-TECDOC-1021) outlining the important factors to be taken into account in the process of realising multinational options. These factors include for example, technical (safety), institutional (legal, safeguards), economic (financial) socio-political (public acceptance) and ethical considerations. After examination of many rational arguments, potential benefits and challenges for the development and implementation of multinational repositories, the 1998 report concluded that:

- the multinational repository concept does not contradict ethical considerations;
- the high ratio of fixed to variable costs for a repository ensures that considerable economies of scale will apply; and
- transport of nuclear material is so safe that the distances resulting from a multinational repository will not have a significant impact on public health.

The new report reviews the work done in the previous study, taking into account developments since its publication in 1998 as well as current activities in the field of multinational repositories. Important objectives of the report, in addition to those mentioned above, are:

- to serve as reference document for the Member States potentially interested in multinational repository concepts as hosting, partner or third party countries;
- to define the requirements that should be followed by interested Member States as hosting, partner and third party countries for pursuing such a co-operative effort;
- to examine the potential role of international organisations in multinational repository development;
- to propose further studies that could clarify open technical and institutional questions and to formulate recommendations on how work in this area might proceed further.

Drafters and contributors to the documents have been from Austria, Czech Republic, Germany, Slovenia, South Africa, Switzerland, and the USA. The Technical Committee that reviewed the latest draft

included also persons from Argentina, Belgium, Italy, Lithuania and the EC.

Increased attention devoted to spent sources: The security of disused radiation sources is of greatly increased concern. There are fears that many users worldwide, and some countries, do not have proper tracking and control of spent sources, raising the possibility of their easy diversion to use in 'dirty bombs'. In March 2003, the IAEA held a conference to address this security issue. Co-disposal of sources in a deep geological repository for fuel cycle wastes is clearly a sensible solution for countries developing such facilities, but many other countries do not foresee a requirement for a deep repository. The alternative being evaluated at present is the use of properly designed and managed borehole disposal facilities. This technology may be suited for providing a safe and affordable disposal route in developing countries, such as the numerous African States that use sealed sources, and South Africa has played a leading role in developing the concept. Critically, proper disposal facilities need to be available to countries that do not have the technology or the resources to implement national disposal projects. This implies the development of regional or multinational facilities. A number of countries each with only a small inventory of spent sources could agree to share a repository or a borehole disposal facility situated in one volunteer state. A larger country with significant volumes of waste requiring deep disposal might agree to help developing countries.

As noted in the last Newsletter, the potential for regional initiatives to ease the security hazard of spent sources was referred to directly by US Energy Secretary Abraham, who chaired the IAEA Conference. He stated that the USA is "prepared to work with other countries to locate, consolidate, secure, and dispose of high-risk, orphan radiological sources by developing a system of national and regional repositories to consolidate and securely store these sources". In addition, the IAEA is finalising a report on 'Disposal Options for Disused Radiation Sources' and Neil Chapman attended the latest meeting in May.

Director General's speech: In his speech to the General Conference (which is viewable in its entirety on the IAEA website), the Director General included the following passage on International Co-operation on the Nuclear Fuel Cycle that is of direct interest for Arius members.

"Before leaving my discussion of nuclear power and the nuclear fuel cycle, I should mention that both the INPRO report and other studies have stressed the fact that the area of fuel cycle design and operation may face a number of critical choices for the future, in part to address proliferation and waste management concerns. This is an important issue that has been discussed over the years, but in my view now merits serious consideration, as part of our effort to cope with the increasing non-proliferation, safety, security and technical challenges facing nuclear power. Such a consideration should include the merits of limiting the use of weapons usable material (plutonium and high enriched uranium) in civilian nuclear

programmes, by permitting it only under multilateral control. Similarly, we should also consider limiting the processing of such material — and the production of new material through reprocessing and enrichment — to international centres. These limitations would need to be accompanied by appropriate rules of transparency, control and above all assurance of supply. It is clear that strengthened control of weapons usable material is key to our efforts to strengthen non-proliferation and enhance security.

Our consideration should also include the merits of multinational approaches to the management and disposal of spent fuel and radioactive waste. Not all countries have the appropriate conditions for geologic disposal — and, for many countries with small nuclear programmes for electricity generation or for research, the financial and human resource investments required for research, construction and operation of a geologic disposal facility are daunting. Considerable economic, safety, security and non-proliferation advantages may therefore accrue from international co-operation on the construction and operation of international waste repositories. In my view, the merits and feasibility of these and other approaches to the design and management of the nuclear fuel cycle should be given in-depth consideration. The convening of an Agency group of experts could be a useful first step."

Arius at ICEM-03, Oxford, UK

An Arius paper on the status of multinational solutions was presented at the major ICEM conference in Oxford in September (*Progress with Multinational Storage and Disposal Concepts*: McCombie and Chapman). The topic also caused much animated discussion at an earlier Panel Session on 'Achieving Legitimacy in National Waste Management'. Although the focus of the session was meant to be more general, it quickly narrowed in to discussing the ethics of multinational solutions — a topic which always generates much interest and which everyone seems to want to talk about. The overwhelming body of opinion was that safe shared solutions hosted by willing communities in willing countries were certainly an ethical approach — and indeed must happen in an enlarged Europe filled with many small countries. Strong disagreement was expressed primarily by the representative of the UK waste management programme, who argued for self sufficiency in waste disposal — and also in electricity production and fossil fuel usage.

Special Session on multinational storage and disposal planned for Waste Management meeting WM'04 in Tucson, USA

At the annual Tucson Conference to be held from February 29th to March 4th 2004, a special session is planned to be devoted to the topic of multinational storage and disposal. In addition to a contribution from Arius, papers are expected from the IAEA, from the US State Department, Russia, Slovakia, South Africa and Germany. The paper submitted by Wolfgang Dietze of the Institute of Public International Law at the University of Göttingen in Germany is based on thesis work being done on the topic of

"Legal Issues involved in the International Disposal of High Level Radioactive Waste" and this will be of especial interest for Arius. In another interesting contribution on legal and policy aspects, Alex R. Burkart from the US State Department will talk on considerations for U.S. approval to retransfer spent fuel with U.S.-origin Uranium for storage and disposal in international facilities. Piet Bredell from South Africa will give a view from a country that is in a developing area of the world. The paper from Vladan Stefula of Decom in Slovakia will discuss the SAPIERR initiative that has been submitted jointly with Arius to the EC and will also describe the status of the EC Waste Directive and its potential impact on small countries in Europe. Vladislav Petrov from Russia will describe the Krasnokamensk initiative on international storage and disposal that is described in the article on Russia in this issue of the Arius Newsletter.

Developments elsewhere around the world

Norway: Spent fuel from Norway's two research reactors needs interim storage pending eventual disposal. The Norwegian regulatory agency, NRPA, considers that a central European repository might eventually be a solution for these wastes. Aiming for a Norwegian repository may be premature when there are several European countries with small amounts of HLW and spent fuel for whom a common solution might be best. An NRPA spokesperson noted that this meant that Norway might have to accept that it could be the host for such a repository.

Upcoming Conferences

This section of the newsletter highlights conferences in early 2004 that are specifically relevant to Arius activities and objectives. Those at which Arius is attending or presenting papers are indicated.

February 2004

29th February - 4th March WM'04 - 30th Annual Waste Management Symposium, Tucson, AZ (US)
(Arius paper)