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International Cooperation In The Field Of Reprocessing

By

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INTRODUCTION

1. 1982 and 1983 were marked by two anniversaries : The International Atomic Energy Agency and the OECD Nuclear Energy Agency celebrated their 25 years of existence respectively in 1982 and 1983. These anniversaries presented a suitable occasion to review the past experience in the field of the peaceful uses of nuclear energy, reflected particularly in the title "International Conference on Nuclear Power Experience" (NPE) organized by the IAEA in Vienna in September 1982. Like the UN Conferences on the Peaceful Uses of Nuclear Energy and the IAEA Salzburg Conference on Nuclear Power and its Fuel Cycle (1977), the NPE Conference comprised a session on international co-operation covering the entire fuel cycle /1/. The experience gained and the results achieved in this field were equally reviewed by Pelzer and Strohl with particular emphasis on the legal and institutional aspects /2/.

2. In the field of reprocessing of spent nuclear fuel, international co-operation has played a role(and to some extent still does) but, compared to other nuclear activities, a rather limited one, at least if international co-operation is defined in a restricted sense as pointed out hereafter /3/. The examples cited in this context are the European Company for the Chemical Processing of Irradiated Fuels (EUROCHEMIC) and the United Reprocessors GmbH. Especially Eurochemic has often been cited as a model (in the good and the bad sense of the word) for international co-operation in the

field of reprocessing [4]. The present paper, which concentrates on the legal and institutional arrangements which have been conceived or are conceivable, will therefore refer in particular to the legal framework set up for that Company as well as to the lessons which might be learned therefrom.

DEFINITION OF INTERNATIONAL CO-OPERATION

3. The range of legal and institutional arrangements that could be devised for carrying out internal co-operation in the field of reprocessing is very wide, and the examples of Eurochemic and United Reprocessors provide only a limited illustration of the possible solutions. As a matter of fact, most forms of international co-operation in the technical field, involving R&D work and/or industrial activities, provide useful examples of how to solve the problems related to the legal nature and structure of international reprocessing arrangements [5].

4. The term "international co-operation" in its broadest sense would include all arrangements involving participants from at least two different countries, such as the reprocessing contracts concluded between the French Cogéma and foreign customers or bilateral technology transfer agreements such as the one concluded between the Federal Republic of Germany and Brazil which covers reprocessing as well [6]. For the purpose of the present paper, international co-operation is defined in a narrower sense which excludes international contracts of a commercial nature as well as bilateral intergovernmental agreements providing a framework for co-operation in the general field of nuclear energy, including the back-end of the fuel cycle, and at the same time taking account of non-proliferation objectives. This definition equally excludes multinational (or transnational) undertakings in the commercial sense, i.e. companies or other entities established in different countries and linked in a way that one or more of them are able to exercise a significant influence over the activities of the others (dominant undertaking) as part of a commercial strategy.

5. International co-operation in this more restricted sense will thus require the establishment of a legal structure by agreement between governments or non-governmental entities representing the interests of several countries, with the objective of carrying out jointly and on a continuous and durable basis, specific activities of general interest to the participants in the field of reprocessing.

LEGAL AND INSTITUTIONAL ARRANGEMENTS

6. International arrangements in the field of reprocessing were lastly examined in the framework of the International Nuclear Fuel Cycle Evaluation (INFCE) by Working Group 4 on reprocessing, plutonium handling and recycle [7] which to some extent relied on the IAEA Study on Regional Nuclear Fuel Cycle Centres [8] and on a paper prepared for a Symposium on International Arrangements for Nuclear Fuel Reprocessing [9]. The same problems are considered

by the IAEA Expert Group on International Spent Fuel Management.

7. INFCE Working Group 4 considered six possible models for institutional arrangements for reprocessing, plutonium storage and transport, and MOX fuel fabrication [9], the following three of which are relevant here in the sense of the above definition :

(a) multinational projects and national facilities with multinational participation;
(b) multinational or regional nuclear fuel cycle centres (RNFCCs) under IAEA or other international auspices;
(c) international nuclear fuel authority (INFA).

8. These models were evaluated on a comparative basis in the light of assessment factors such as economics, resource utilization, non-proliferation, assurance of supply, environmental impact, and special needs of economic countries. The conclusion of the Working Group on institutional arrangements states inter alia [10]: "Security of supply may also be better assured by multinational or international arrangements, which at the same time offer economic advantages (from economies of scale) and may help to reduce the risk of proliferation ... It seems desirable that the evolution of institutional arrangements should be towards such multinational ventures and could eventually result in the development of regional nuclear fuel cycle centres. However, the practical difficulties in establishing and operating such ventures should not be underestimated. The nature of an international fuel authority is not yet clear and its formation and operation would require a major international initiation; there is little indication at present of any demand for the services of such an authority."

9. It would appear that the conclusions of Working Group 4 favouring the establishment of "multinational ventures" as a first step towards regional nuclear fuel cycle centres was influenced by existing arrangements such as Eurochemic although, as will be seen later, this example is by no means a perfect one. It is also to be noted, that almost all of the eight INFCE working groups considered the desirability of multinational institutional arrangements, especially from the point of view of safeguards, supply assurance, and economics [11].

10. When considering the setting up of international co-operative projects in the field of reprocessing (possibly combined with other activities related to the back-end of the fuel cycle such as spent fuel storage and waste disposal), it will be necessary to decide on the following questions which are often so interrelated that the options for one solution will imply certain other ones [12]:

(a) Membership: The participants representing the interests of the countries involved could be governments, governmental agencies or (semi-) public organisations, private companies, or a combination of these entities. The procedure for admitting new members would also have to be fixed as well as the conditions for withdrawal.

(b) Legal status: The first question to be considered here is whether one should endow the project with an independent legal personality or rather opt for a "no-new-entity approach" (as in the case of the

OECD/NEA Dragon and Halden projects). In the latter case, one participant would act as host organisation (operating agent, managing participant) on behalf of all members, the co-operative programme being directed by one or more organs composed of representatives of all participants. This model would appear to be appropriate for R&D activities and has so far been used and is still being used for the purpose; for example by the implementing agreements concluded under the auspices of the International Energy Agency, but seems to be less suitable for operations of an industrial and commercial nature where the most convenient legal form would be that of a commercial company established according to the law of the host country /13/.

(c) The constituent instrument in that case could be an agreement under private law, even if governments are shareholders. However, international obligations or national policy constraints may lead governments to require their involvement in the decision-making processes to be fixed by an international agreement as defined by public international law (treaty, convention). This could notably be the case if international co-operation in the field of reprocessing were to be combined with other activities related to the back-end of the fuel cycle, particularly the long-term storage and disposal of radioactive waste which are generally considered as activities falling under governmental responsibility /14/. There are a number of examples including Eurochemic, where a combination of an international convention with annexed (or independent) statutes was used to achieve this result. The conclusion of a treaty or convention would also facilitate the granting of certain privileges and immunities (tax exemptions, immigration restrictions, etc.) which could be granted to undertakings established purely under the law of the host country but by the cumbersome procedure of adapting the national legislation. On the other hand, the conclusion of a treaty carries the risk of having to go through lengthy amendment procedures (which may include the annexed statutes) when particular matters regulated in those instruments have to be modified in view of evolving circumstances. Such a rigid procedure could be an important obstacle to the flexibility required for industrial activities.

(d) Applicable legislation: International co-operation in the field of reprocessing (and in other technical and industrial activities) cannot be exclusively governed by international law or the provisions of a treaty. If a treaty is chosen as constituent instrument, it may limit the scope of application of the host country's law and grant certain privileges and immunities to the undertaking, but the attempt to escape the application of national law applicable to commercial and industrial operations by necessarily extensive and yet incomplete treaty provisions would be futile. In case the co-operative project is established in the form of a national company, the application of national law is obvious and exemptions, in particular in the field of fiscal law, may be difficult to achieve /15/.

(e) Decision-making: The decision-making structure is of course closely related to the membership - which in turn will influence the legal status - and to the financial arrangements. When governments are participating and contribute to the capital or operating costs, a two-tier structure would be appropriate - a controlling body composed of representatives of the participating governments and an

executive organ (board of management/directors) responsible for the management. In the absence of governmental or public participation a single decision-making body would be sufficient as provided for by many national laws for commercial companies. However, the mere participation of governments or public bodies does not necessarily determine the choice of the former structure. But reprocessing is a sensitive technology with many national and international policy implications, and it is likely that participating governments will wish to safeguard their interests by means of a supervisory body although their interference might weaken the efficiency of commercial operations.

(f) The management and operation of an international reprocessing plant could be ensured by staff recruted from all participating countries. This could be the most logical solution in case of a separate legal entity. Care should however be taken to avoid a more or less rigid system of national quotas. Where the no-new-entity appraoch is chosen, the host organisation (operating agent) will most likely provide most of the personnel.

(g) Rights and obligations of the participants: These questions have to be settled in the light of various factors and are dependent to a large extent on the legal status and membership of the undertaking. For example, if an international reprocessing project is set up as a commercial company in a given country, it will be subject to the latter's international obligations in the field of non-proliferation and safeguards. The participants in turn may be obliged to respect international commitments (return of plutonium, etc.). Apart from these obligations, the constituent instrument of an international reprocessing facility should regulate in particular:

- the participants' share in the reprocessing capacity of the plant and the consequences of the non-use of such capacity;
- the participants' access to the plant technology and the know-how acquired during its construction, operation and decommissioning;
- the responsibility for the waste: Should the participant/customer be responsible for returning the waste (after conditioning and possibly intermediate storage) or should the waste be stored and disposed of in the host country ?
- the responsibility for plant decommissioning;
- liability for accidents; when the international reprocessing project is established as an entity enjoying legal personality it will be considered as the operator of a nuclear installation in the sense of the international liability conventions and/or national legislation, and the corresponding insurance premiums will form part of the operating costs; in case of no new legal entity being created, it might be necessary to provide for the operating agent's indemnification by the participants in case of a nuclear accident.

(h) Financing: Many different financial arrangements are conceivable for an international reprocessing undertaking; from the formal point of view, they depend on its legal status. If set up as a commercial company, participants could subscribe to a percentage of the investment capital proportional to their desired share in the plant's services which would guarantee an access to the plant's capacity while

they would be required to pay the reprocessing services to cover the operating costs. Pre-financing of the investment costs by the future users of the plant (participants and/or third parties) would be another model so that the company's equity could be rather limited. Flexibility is an important element as the reprocessing requirements of the participants as well as of the market may change over the years as shown by past experience.

(i) Location of the facility: Unless an international reprocessing undertaking is based on an existing plant, the choice of the host country and the site is one of the most important decisions. It will depend on a number of political, economic, geographic and environmental factors. An important consideration would be the willingness of the host country to accept and store large quantities of spent fuel and radioactive waste for considerable periods of time, as well as the co-location of other fuel cycle services (spent fuel storage, fuel fabrication and possibly waste repositories).

THEORY VS. REALITY : THE EUROCHEMIC EXPERIENCE

11. The above list of principal considerations in the setting up of international co-operative projects in the reprocessing field is of course a theoretical check-list based on a number of examples of international scientific and technical co-operation, and in particular on that of the Eurochemic Company. It is therefore appropriate to review briefly the legal and institutional arrangements adopted for Eurochemic in the light of various points mentioned above /16/.

12. At the outset, it is recalled that Eurochemic operated a reprocessing plant in Mol/Belgium from 1966 to 1974. The plant, having a nominal capacity of 70 t/y, treated a great variety of irradiated fuel elements coming from the member countries' research and power reactors, amounting to a total of some 220 tons. These activities were accompanied by an extensive R&D programme and the training of specialists in the field of reprocessing. In the light of the unfavourable situation and prospects of the reprocessing market, the Company's organs decided in 1971 to shut down the plant towards the end of 1974. This decision was based exclusively on economic reasons and had nothing to do with technical failures as asserted by Mr. Makhijani in the paper entitled "Bubble, Bubble, Toil, and Trouble : Reprocessing Spent Fuel" /17/. In 1978, Eurochemic concluded a Convention with the Belgian Government providing for the transfer of the Company's industrial site to a Belgian Company or body and determining its obligations towards the host country as regards the management of the waste resulting from plant operation. Eurochemic went into liquidation on 27th July 1982 and will probably be wound up by 1984/1985.

13. The founders of the Eurochemic Company pursued two main objectives: The carrying out of R&D work to acquire the reprocessing technology and its industrial application, as well as the furnishing of an industrial service. To achieve this goal, they considered it necessary to establish a co-operation between governments and industry, the former taking the initiative to set up the

undertaking and the later taking over as soon as the operation became profitable. A legal structure had therefore to be found which at the same time replied to the needs of a research centre and an industrial enterprise, and which associated governments and industry in the financing and management of the undertaking. Given the then situation in Europe in the reprocessing field as well as the intention of the founders, it was necessary to create a new undertaking which would itself realise the installations required for the co-operative programme. Lastly, the undertaking should have a true international character founded on the principle of equal access of all participants to the management of the programme, the experience acquired and the capacity of the plant.

14. These objectives and conditions led to the constitution of a joint undertaking in the form of an international joint stock company, by means of an international convention signed by the government of thirteen European OECD/NEA member countries. The Eurochemic Convention of 20th December 1957 regulates the international aspects of the Company - the relation to the host government, certain privileges and immunities, and in particular the control of the governments party to the Convention through the so-called Special Group of the NEA Steering Committee for Nuclear Energy. The Company's statute is annexed to the Convention and corresponds with some modifications to the statute of a joint stock company (société anonyme) under Belgian law: it fixes the capital, the composition and powers of the organs (Board of Directors, General Assembly, Management), and rules over access to the know-how acquired by the company. It is to be noted that all important decisions of the General Assembly (such as amendments to the Statute, including capital increase, conclusion of reprocessing contracts with customers from non-member countries which in fact were never concluded) require the approval of the Special Group either by unanimity or a three-quarters majority. Eurochemic is thus an example of an international undertaking created by a treaty and endowed with a legal personality independent from any national body or enterprise. The decision-making structure follows the two-tier approach referred to above.

15. As regards the membership, the original intention of the governments signatories of the Convention, which subscribed to the initial capital either themselves or designated public bodies to that effect, to transfer the shares to their countries' private industry, could be realised to a small extent only [18]. The participation in Eurochemic was quite inhomogeneous, at least for an undertaking engaged in industrial reprocessing activities. Soon after the entry into force of the Convention the national nuclear energy programmes in the member countries had developed to such a different degree that one could speak of "developed" and "under-developed" partners. Neither the Convention nor the Statute contain provisions permitting the elimination of participants not accepting the same obligations as the other ones.

16. The Eurochemic Company is subject to Belgian law to the extent that the Convention and the Statute do not derogate therefrom. The practical application of this provision turned out to be far less important than anticipated. The tax exemptions stipulated in the

Convention, which were purposely restricted in order not to give the Company a preferential competitive position, proved to be insufficient to alleviate the deficits. Besides certain exemptions from immigration restrictions, Eurochemic's personnel is subject to Belgian fiscal, social and labour legislation. All these features corresponded to the idea that the Company would ultimately carry out a profitable or at least self-supporting commercial activity. The application of Belgian law was stipulated in the construction and reprocessing contracts concluded by Eurochemic.

17. As regards the rights and obligations of the shareholders, Eurochemic's constituent instruments are quite incomplete, notably concerning the obligations. While it is true that no legal formula would have allowed to overcome the difficulties of the reprocessing market which led to the shutdown of the plant in 1974, certain elementary precautions would have improved the Company's situation, such as a provision guaranteeing Eurochemic the exclusiveness of reprocessing contracts by its shareholders and protecting the Company against the competition by the latter /19/. Corresponding to the first generation of reprocessing contracts, these contracts concluded by Eurochemic stipulated that all material (fission products, waste, transuranium elements) other than the recovered uranium and plutonium became the property of Eurochemic. The ultimate responsibility for the conditioning, storage and disposal of the waste was not regulated at all. Article 32 of the Statute merely provides that "upon the liquidation of the Company, an agreement shall be concluded with the Government of the Headquarters State ... as regards the possible taking over of all or part of the installations as well as the storage and control of radioactive waste."

18. The financial arrangements adopted for Eurochemic proved to be quite insufficient to cope with the difficulties of the reprocessing market. The Company's financial problems were not only due to the latter but also to weaknesses in its legal form and structure. The Statute did not provide for a sufficient initial capital to be called up in the light of evolving financing needs according to currently updated estimates. No use was made of fixing an "authorised capital" well known in Anglo-american and German law whereby the (amended) Statute would have empowered the Board to increase the capital within certain time limits and up to certain amounts. The fact that this possibility was (and still is) unknown to Belgian law, would have been no obstacle as the Statute could have been derogated therefrom. Instead, every capital increase required an amendment to the Statute by decision of the General Assembly which was subject not only to the approval of the Special Group but in some participating countries even to parliamentary approval as the Statute was considered to form an integral part of the Convention ratified by the legislature of those countries. This lengthy procedure was counterproductive to the need for swift and flexible financing decision procedures of a commercial company. The Statute does not contain provisions on the covering of operational deficits, this being quite in line with the rules on commercial companies. As the shareholders could not agree on further capital increases, it would have been logical to put the Company in liquidation as soon as the loss of the capital became imminent. Instead, the governments

party to the Convention agreed, with some exceptions, to subsidise Eurochemic by means of contributions fixed according to the OECD scale. Eurochemic originally conceived as a commercial company, became thus in practice an international public undertaking.

FUTURE PROJECTS

19. As pointed out above, the 1978 Convention concluded between Eurochemic and the Belgian Government provides for the taking over of the Company's industrial site by a Belgian company or body; As a matter of fact, ever since the decision to shut down the plant; the Belgian Government and utilities had declared their intention to resume plant operation either alone or in collaboration with a limited number of foreign partners. For political reasons, the decision on plant recommissioning was deferred several times and eventually, by an act of August 1980, made subject to parliamentary approval. In 1982 and 1983 the two chambers of the Belgian Parliament, in the framework of a general energy debate, recommended the recommissioning of Eurochemic's former plant within the existing release limits. The State took a 50% participation in the Synatom Company which grouped the Belgian private utilities' interest in nuclear fuel cycle services.

20. On 27th July 1983, Synatom, now a mixed company renamed in full "Société belge des Combustibles Nucléaires Synatom", the Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH (DWK) and the Compagnie générale des matières nucléaires (Cogéma) formed a study syndicate under the name "Sybelpro", Synatom taking a 60% participation and the two foreign partners 20% each. The syndicate has the purpose of preparing the necessary elements to enable a final decision as to whether or not to implement the recommissioning project. It will especially carry out studies to determine the nature and importance of the refurbishing and modernisation works, establish a price estimation of these works, and prepare a preliminary safety analysis report to be submitted to the Belgian safety authorities in view of obtaining their favourable advice before realising the project. By the end of 1983/beginning of 1984, the syndicate members should have sufficient technical and economic information enabling them to take the decision whether or not to implement the project. After one or more of the members (among them necessarily Synatom) has taken a positive decision on plant recommissioning and the Belgian Government has confirmed its positive attitude, a Belgian joint stock company, probably denominated "Belgoprocess", will be founded by Synatom and foreign partners, the latter subscribing to a maximum aggregate of 49% of the capital of which 20% each would be reserved to the potential partners DWK and Cogéma. The object of the new company would be to refurbish and operate Eurochemic's former plant with the purpose of reprocessing as far as possible a wide variety of spent fuel (LWR standard and non-standard fuel, MOX fuel, fuel originating from other reactors). The principles governing the future Belgoprocess company as accepted by the Sybelpro syndicate members foresee further an access to the reprocessing capacity of the refurbished plant which is planned to be in the order of 120 t/y for LWR fuels. Each shareholder will be

entitled to have a part of its spent fuel reprocessed which is proportional to its share in the capital, or to propose customers for the same quantity. As a counterpart, the foreign shareholders will grant the Belgian partner an equivalent access to one of their future plants. The cost of plant refurbishing and operation as well as a provision for dismantling would be financed in the form of advance payments made by customers having concluded reprocessing contracts with Belgoprocess or by the shareholders acting on behalf of future customers. The conditioned waste arising from reprocessing foreign fuel would in principle be returned to a country outside Belgium to be specified by the customers, the costs thereof to be borne by the latter.

CONCLUSION

21. The past experience of international co-operation in the field of reprocessing leaves one with mixed feelings. Eurochemic was undoubtedly a technical success and achieved its objective of furnishing considerable know-how to the participants and of forming reprocessing specialists; the plant was operated during eight years without any major incident. The Company's waste management, decontamination and decommissioning programmes are still a source of valuable information. However, from the financial and commercial point of view, Eurochemic was a "flop". A succession of errors in estimating the construction and operation costs as well as the needs of the reprocessing market, the absence of a strong industrial participation, and eventually the decision of the two biggest shareholders to set up the United Reprocessors GmbH together with a competitor, British Nuclear Fuels Ltd., led to the shutdown of the plant. The strong influence of the shareholding government, the diverging opinions among them about the size and objective of the plant, and their endless quarrels about financing make Eurochemic a rather bad example of co-operation between governments and industry. Eurochemic was never a joint undertaking in the sense of implementing a common long-term reprocessing policy of all governments party to the Convention, as the OECD/NEA did not succeed to fulfill its role as mother organisation in elaborating some sort of common approach in this field.

22. Whether there is a future of international co-operation between governments and industry in the field of reprocessing is difficult to say. As shown by other examples, governmental involvement is concentrating on new technologies (fast breeder, fusion) still requiring considerable R&D work. Reprocessing by means of the Purex process is today a mature technology and there seems to be no need to carry out important research programmes with the help of governments. This is all the more true for commercial scale reprocessing. There may however be some incentive for certain governments to ensure access to reprocessing services abroad, especially when the nuclear programme in their countries depends on such services being available, by directly participating in international reprocessing undertakings. Non-proliferation, safeguards and physical security aspects may also lead governments to take part in multinational arrangements with a view to controlling decisions having an

impact on national and international policy, in particular if reprocessing is combined with other back-end of the fuel cycle activities, e.g. spent fuel and plutonium storage. For the time being, no such projects are in sight. Neither the results of the IAEA study project on regional fuel cycle centres, nor the recommendations of the INFCE Working Groups have so far been followed by concrete governmental actions aimed at the setting up of multinational arrangements in the reprocessing field. The present controversy over the need for reprocessing (both from the economic and waste management point of view) does not create a climate favourable to a genuine political commitment to support and carry out a long-term international programme. In case such projects should be realised in the future, the Eurochemic experience suggests that the necessary legal and institutional arrangements have to be carefully considered lest the mistake of the past be repeated; the importance of the legal structure which has been adopted becomes apparent when difficulties arise.

23. As regards international industrial co-operation, the United Reprocessors GmbH (URG) was mentioned as an example /20/. But this company, which was created with the principal objective of co-ordinating the reprocessing interests of the three partners on a market suffering from overcapacity, cannot be considered as a particular success. As Eurochemic, URG suffered from unexpected developments and remained more or less dormant for a number of years. Moreover, URG never planned to operate a joint reprocessing plant. The only venture of this kind which has reasonable chances of being realised in the near future is the Sybelpro/Belgoprocess project of recommissioning the former Eurochemic plant. As pointed out above, the final decision leading to the creation of the Belgoprocess company will depend on a number of factors which in the first place are of a Belgian nature. It is clear that the company will not be constituted without the participation of the Belgian partner Synatom representing the host country. It is likely that Synatom, all economical, technical and political conditions being positive, will realise the recommissioning project even without foreign participation. The refurbished plant's capacity could cover about 70% of Belgium's reprocessing requirements (as from 1985) of spent LWR fuel and ensure considerable independance from foreign reprocessing services. The decision of the foreign members of the Sybelpro syndicate to participate in Belgoprocess will probably be determined by different considerations. The interests of Cogéma would appear to be directed towards the reprocessing of special fuel while those of DWK seem to lie in the acquisition of know-how for the projected plant of 350 t/y, the formation of technicians and the reprocessing of LWR fuel. The basic principles underlying the foundation of Belgoprocess have been laid down in the Sybelpro syndical agreement. However, some crucial details will still have to be negotiated in detail when it comes to adopt the Belgoprocess statute, notably the pre-financing scheme and the reciprocity in access to the partners' reprocessing services. Here again it will be important to observe the rule that the legal arrangements adopted will undergo their test when differences and difficulties emerge.

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/3/ At the NPE Conference, only one paper reviewed international reprocessing, cf. von BUSEKIST, O., DETILLEUX, E., OLIVIER, J.P., Fuel Reprocessing and Waste Management, Twenty years of experience in the OECD Nuclear Energy Agency and the Eurochemic Company, Nuclear Power Experience, IAEA, Vienna 1972, vol.3, p. 83.

/4/ STROHL, P., op.cit. (1) and (2) and Appraisal of Legal and Administrative Problems Concerning the Setting up and Operation of Joint Projects in the Field of Energy R&D, in Regional Fuel Cycle Centres, Vol. II, IAEA, Vienna 1977, p. 83.

/5/ STROHL, P., op.cit. (2), Appendix II,(Synoptic table of selected undertakings in technical fields); Eurochemic's structure is partly based on the example of the European Company for the Financing of Railway Equipment (Eurofirna).

/6/ See FABRICIO, R.A.C., and LOOSCH, R., The Development of a Bilateral Technology Transfer Agreement, IAEA-CN-42/7 and 376 (papers presented at the NPE Conference); the text of the Agreement of 26/27 June 1975 is reproduced in Nuclear Law Bulletin no. 16.

/7/ INFCE/PC/4, Vienna, Austria, 1980, p.171.

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/9/ op.cit. (7), p.177.

/10/ INFCE Summary Volume, IAEA, Vienna 1980, p.154.

/11/ op.cit. (10), pp. 44-48.

/12/ op.cit. (7), pp. 178 and 295; STROHL, P., op.cit. (4).

/13/ cf. STROHL, P., op.cit. (2), Appendix II.

/14/ REYNERS, P., and STROHL, P., Aspects juridiques, administratifs et financiers de la gestion à long terme des déchets radioactifs, IAEA-CN-43/163, paper presented on the IAEA International Conference on Radioactive Waste Management, Seattle, 16-20 May 1983.

/15/ Certain tax privileges may, and have been, granted to joint undertakings created according to Articles 45 to 551 of the Euratom Treaty - see Annex III to that Treaty.

/16/ For a more detailed analysis see von BUSEKIST, O., Der Werdegang der Eurochemic - eine Bilanz, Atomwirtschaft 1980, Nr. 5, p.258; a French version of this article, updated to mid-1982, was published in Consensus 1982-1 under the title "Eurochemic: échec ou exemple ?".

/17/ Cf. U.S. Department of Energy Comments on the Paper Entitled "Bubble, Bubble, Toil and Trouble: Reprocessing Nuclear Spent Fuel", DOE/NE-0049, March 1983.

/18/ Only in Belgium, France, the Federal Republic of Germany, the Netherlands, and Italy private industry took over shares representing in total about 9% of the capital.

/19/ A provision to that effect is contained in Article III of the Almelo Treaty of 4 March 1970 constituting Urenco.

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