Interaction between Control and Acceptance of Nuclear Energy in Switzerland: Aims and Implementation

by Claude Zangger

GENERAL TRENDS

It is an indisputable fact that a rift has occurred within the Swiss population – and also abroad – with regard to the expediency of the peaceful use of nuclear energy. This phenomenon fits into a broad background of growing distrust on the part of the public in face of the gradual entrenchment of massive and complex technologies, such as immense nuclear and hydroelectric power plants, huge aircraft, a mammoth oil industry, giant computers, highly sophisticated telecommunications systems, and so on. This distrust stems to some extent from the growing difficulties that citizens have in understanding, as a whole, the scientific, technological, socio-economic, legal and political issues that they are confronted with by each of these new technologies. It is likewise the result of keener perception of the negative influences that are thereby brought to bear, either potentially or in reality, on their personal lives, together with diminished perception of the advantages to be gained from them. The complexity of an advanced industrial society seems to them more and more bewildering, and they are all the more perplexed by the observation that the experts only feel at home in their own sphere of competence and that experts in different fields give the impression of not understanding one another. This perplexity is reinforced by confusion, for the experts specializing in one field are nevertheless ready to give authorative opinions on matters that do not bear directly upon their own specialized training, and a new type of expert is beginning to emerge – the biassed expert who enthusiastically mixes facts and personal feelings either in support of a cause or in opposition to it. Finally, although the mass media can be credited with having played a major role in developing public awareness of such matters, the information available is still inadequate, both in quantity and quality, to satisfy the needs of the citizen who feels frustrated when he is faced with what are fundamental, indeed universal problems and yet has no chance of getting the information on them that he needs.

Within this context nuclear energy occupies a special place by virtue of the specific risks attached to radioactivity and the diversified nature of the hazards involved in the use of it, starting with the extraction of ore and ending with the final disposal of radioactive waste.

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In this respect, furthermore, the sensitivity of the population has unfortunately been heightened by the use, at times well-intentioned, of such shock-effect expressions as a "necessary evil", "nuclear wager" and "faustian bargain", all of which can lay no claim to objectivity, except in relative terms. The outcome of this trend is that Swiss public opinion today is under pressure from two extreme fringes of the population – those who predict that nuclear energy will bring disaster and those who forecast that it will bring social progress. Between these two extremes, very fortunately, there is a middle path for a popular consensus yet to be formed – a goal that still requires a major *information* campaign

As to the formation of a popular will in this sphere, it is likewise undeniable that the growing complexity of science, technology and economics, together with the complications they cause, have created and steadily deepened *a rift between the citizens and the political, scientific and economic authorities.* The citizens are ever more at a loss to understand the situation, and hence to help solve, through democratic processes, the problems facing politicians, scientists and economists. The danger is at present so great that they may be tempted to give way to resignation, thereby leaving the coast clear for a struggle between ideological minorities. In the field of nuclear energy this temptation is particularly marked today, partly owing to the inadequacy of the information on the subject obtainable by citizens, and partly because the legal situation and overall licencing system in Switzerland are highly intricate. The upshot of it all is that the man in the street is left in the dark and does not know at what stage he can get hold of the facts and make himself heard. Furthermore, this state of affairs affords legal experts a multitude of opportunities for appealing against decision, opportunities which are systematically utilized for one and the same project, thereby increasing still more the general confusion among the Swiss population. Thus there is need for an *adjustment of the legal provisions and licencing procedures* that will bring the citizens and their executive authorities closer together.

The doubts arising in the minds of the Swiss population on the subject of nuclear energy cannot but lead, moreover, to the point where the extent of nuclear activities in Switzerland is questioned as a whole. This questioning relates, first, to the place to be occupied in the middle and long term by nuclear power and heat production among all energy sources and, second, to problems that could arise from the legal and practical standpoint, at other stages of the nuclear fuel cycle. problems created for Switzerland abroad (in connection with assurance of supplies and services for example), and also, problems arising within Switzerland itself (decommissioning of nuclear plants and radioactive waste disposal). In other words, nuclear power production must be tied in with an *overall, coherent energy plan* that will have to be submitted to the judgement of the country's citizens, so that they can form an opinion on the need for nuclear energy and the scale on which to use it. This plan is being worked out at federal level and will be made public in the course of this year (1977).

CONTROL OF NUCLEAR ENERGY

From the standpoint of developing a democratic will to control the construction and operation of nuclear facilities, it is noteworthy that this will is expressed in terms of four federal laws that have been passed independently at different points in history in order to achieve different ends, but which, taken together, cover all aspects of the protection of human beings, the environment and the countryside that have to be considered in the case of each individual project.

Two of these laws fall exclusively within federal competence:

- The Federal Act of 23 December 1959 on the peaceful use of atomic energy and protection against radiation, which applies particularly to the protection of human beings against radioactivity and radiations,
- The Federal Act of 1 July 1966 on the protection of nature and the countryside, which is aimed at preserving the characteristic appearance of the countryside and individual localities.

These two laws have given rise to a single federal licensing procedure by which protective measures can be enforced or, if necessary, a licence withheld. This licence is granted by only one of seven "Ministers" of the Government, to wit the Chief of the Federal Department of Transport, Communications and Energy. The procedure, like the supervision of construction and operation of the plant, is based on the recommendations and activities of a number of specialized federal bodies.

The two other federal laws entrust the Confederation only with the task of overall supervision and invest the cantons with executive competence. These are:

- The Federal Act of 16 March 1955, revised on 8 October 1971, on the protection of waters against pollution, which prescribes, in particular, the protection of waters against thermal discharges (for example, in the case of direct cooling by river water) or chemical discharges (for example, indirect cooling using towers);
- The Federal Act of 13 March 1964, on labour in industry, cottage crafts and commerce, which regulates, among other things, the protection of the surroundings of industrial plants against harmful effects and inconveniences, and which applies specifically to climatic effects and the noise produced by cooling towers.

These last two laws involve two different cantonal licensing procedures, based on the recommendations and opinions of specialized federal bodies, the licences being issued by the cantonal governments.

In certain cantons, furthermore, territorial zoning is subject to approval by the citizens at the level of the commune.

Thus, although it is encouraging to see that the democratic will to control the construction and operation of nuclear facilities is given full scope through the four legislative measures described, it is not quite so encouraging to note that this will is expressed through several independent licensing procedures at three different levels of decision-making, each affording an opportunity for appeal at several instances. Appeals of this nature, which have been entered by citizens and communal authorities in connection with several projects, have brought about considerable delay in the completion of several nuclear power plants in Switzerland. This situation is felt by the Swiss population as a whole to be somewhat obscure.

At this stage of our consideration of the democratic aspects of the matter there is need for a comment of important practical significance. When the citizens are called upon to vote in favour of or against a constitutional article, or when called upon to exercise their right of referendum with a view to rejecting a law passed by Parliament, they are not concerned with the ins and outs of articles in general terms.

Let us take the Article of the Federal Constitution dealing with atomic energy, adopted in 1957, which states that *"Legislation concerning atomic energy is of the domain of the Confederation. The latter formulates provisions relating to protection against the hazards of ionizing radiations"*. Now let us look at the relevant law adopted in 1959, it states, inter alia, that *"the nuclear facility project must provide for all the measures that can reasonably be demanded for the protection of persons, the property of third parties and important rights"* and, elsewhere, that *"compliance with Switzerland's international commitments shall be guaranteed"*. No citizen thought at the end of the fifties, when approving these seemingly essential constitutional and legal provisions, that he would one day be personally involved in a nuclear facility project. It is not until the moment when the law becomes a practical reality that citizens, if involved in such a project, become aware of its implications. As the proverb goes, you don't see the devil till you get down to detail!

This sort of thing is seen more and more frequently in numerous sectors of a society that is becoming increasingly complicated. Structures and establishments of national interest such as airports, hydroelectric dams, nuclear power plants, highways, military installations and so on, are certainly viewed as such by most citizens. But as soon as a project affects their specific interests, the citizens jib against it, and though recognizing in their hearts the need for the project in the common interest, they would rather it was done elsewhere. Such reasoning, furthermore, lies in the nature of human logic; man cannot be expected as such to make a voluntary sacrifice for the sake of the collective, it is too much to ask. It is therefore up to the executive, or, in certain cases legal authorities to find the best solution in the interests of all. Viewed against the background of national undertakings of all kinds, this limitation on the freedom of quite a few citizens, implicit in the adoption of many diversified projects of national interest, seems an indispensable contribution to the collective good.

And so, in order to have their decisions accepted by the sovereign power, the authorities must in future provide the public with the required level of information for each project and ensure adequate opportunity for the expression of individual and collective opinions and objections, which should then be taken into consideration in their decision-making. Furthermore, decisions should be taken at a high enough level in the democratic hierarchy to ensure, as far as possible, respect for both common interests and local concerns.

ACCEPTANCE OF NUCLEAR ENERGY

Let us now turn briefly to the development of the nuclear power programme and the emergence of the nuclear controversy in Switzerland.

From the time electric power was first developed up to the end of the 1960s, the generation of electricity was based mainly on hydroelectric power. At the beginning of the 1960s, however, the residual potential of Swiss water power was dwindling rapidly and the electricity companies drew up plans for a number of large conventional (oil-fired) power stations. Firmly opposed to air pollution by combustion products, the neighbouring population at the projected sites fought hard against all of these stations. Some citizens, realizing that the nuclear combustion process did not directly affect the atmosphere, even went so far as to demand an immediate switch of policy to the cleaner nuclear power plants, pointing out that they were close to being economically competitive. Furthermore, the federal authorities were afraid that the country's dependence on fossil fuel supplies, already great at the time,

might become appreciably greater, and shared the view that nuclear power plants were better for the environment. Around 1963 and 1964, general policy and the climate of public opinion thus took a turn in favour of nuclear plants. Of the various projects for conventional power stations, only one – situated at Chavallon sur Collombey, near one of the two Swiss refineries and rated at 280 MW(e) – passed the critical test of public acceptance.

The first few years, from 1964 to 1969, can be called the "honeymoon" period, The Beznau I and II projects[1] (350 MW(e) each) were accepted and put into service, the former in 1969 and the latter in 1971, virtually without opposition and without delay. Situated about one kilometer from the Federal Institute for Reactor Research, these plants certainly benefited, as far as the availability of information was concerned, from the residence of several hundred Institute staff members in the surrounding communities. The third plant (306 MW(e)), situated at Mühleberg and started up in 1972, also passed muster without too much difficulty thanks to a clever publicity campaign conducted by the firm concerned, since Muhleberg is located in a typically agricultural region, the traditional good will and trusting attitude of the farmers towards technology and science, to which they owe a great deal, lent support to the project.

Beznau I and II and Muhleberg are today the three nuclear power plants in operation in Switzerland, together, they cover some 20% of the country's electricity requirements, a fact which makes the Swiss citizen today one of the largest consumers of nuclear power in the world.

The period from 1969 to 1975 was one of "domestic strife". Its beginning coincided, moreover, with the awakening of public concern over the need to protect the environment, and a growing number of critics amoung the public openly opposed nuclear power plants, though their efforts bore fruit largely on a local level or in regions surrounding the different project sites. I list the projects in an order which roughly reflects a decreasing degree of difficulty encountered at local level: Kaiseraugst, Verbois, Gosgen, Leibstadt, Inwil, Ruthi and Graben.

The opposition was stregthened when in April 1971 the federal authorities, anxious to protect the quality of water against the effects of thermal discharges, prohibited the use of water from the rivers of the Aare-Rhine basin for direct cooling at all new plants.

The designers then found themselves compelled to incorporate very large wet cooling towers in their plans and to apply for new communal or cantonal construction permits, after they had taken considerable trouble to assess the consequences of the towers for the climate at each site and after those consequences had been found acceptable.

The wave of opposition led to appeals against almost all the projects, some of which reached the Federal Tribunal. It was not until mid-1973 that three of them were released, namely Gosgen, Leibstadt, and Kaiseraugst. All three are at present going through one or other of the stages of the federal nuclear licensing procedures; Gösgen and Leibstadt are already under construction, their entry into service being scheduled for 1978 and 1980, respectively.

The year 1975 saw the beginning of the phase of *democratic difficulties.* Prior to that date, the numerous objections to the plants raised at local level had produced nothing more than a very faint echo among the Swiss population, which observed the activities of pro and

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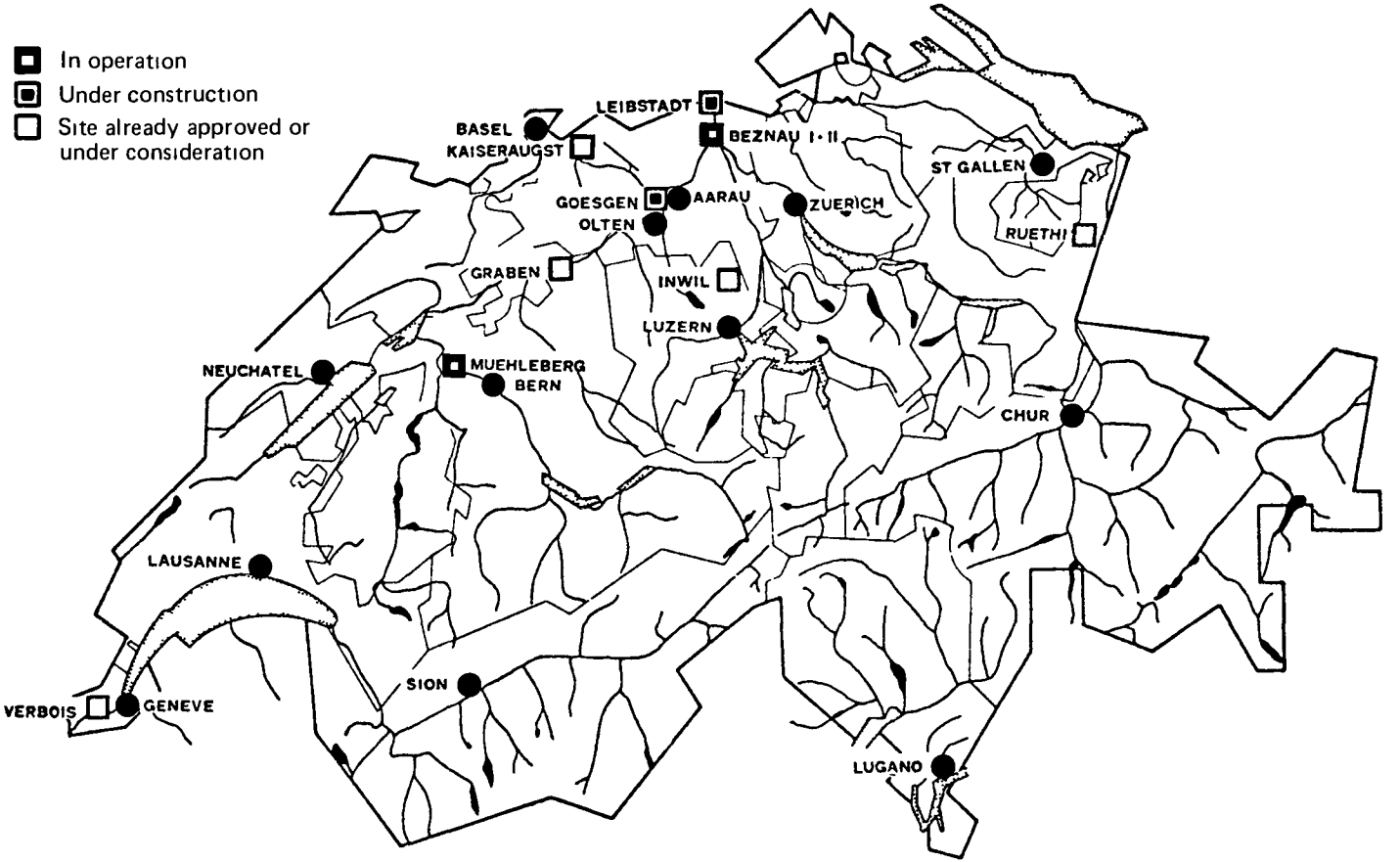
[1] See Figure no. 1 for their locations.

Figure 1. Map showing the sites of nuclear power plants in operation, under construction and at the planning stage



contra groups with amused surprise. However, at Kaiseraugst and Verbois, opposition steadily increased, spreading throughout the region, until finally there occurred a spectacular event which suddenly projected the nuclear controversy onto the national plane, where it has remained a subject of heated discussion ever since. The event in question was the illegal occupation, from 1 April to 14 June 1975, of the site of the future nuclear power plant at Kaiseraugst, on which preliminary work had already started. The long occupation passed off without violence, but one of the seams of Swiss democracy had split in the process.

Negotiations between the squatters and the federal authorities were not entered into until after the evacuation, since the Federal Government had demanded a return to constitutionality as a precondition for negotiations. During the occupation all sorts of groups throughout Switzerland took the opportunity to express their opinions on the legality or illegality of the occupation and the expediency or inexpediency of nuclear energy The arguments put forward by its opponents (safety, radioactive waste, risk of a technocratic police State, etc.) and by its supporters (no other reliable alternative in the short term, etc.) are common knowledge and do not need to be repeated here. The dual nature of the debate, in which local stakes mingled with broad general issues, naturally resulted more in confusion than clarity in people's minds.

The negotiations led the federal authorities to agree to a dialogue, structured and of fixed duration, between the competent federal experts and other experts designated by the squatters on all matters raised by the latter. These discussions, which were held in the autumn of 1975, made it possible to provide the opponents with some information, but, as far as the crux of many issues was concerned they could only be described as a dialogue of the deaf.

The vicissitudes of the controversy also provoked a major debate in the Federal Parliament on the subject of nuclear energy and the events at Kaiseraugst; it lasted almost eight hours, an unusual length for a debate in the Swiss Parliament. Among the six political parties with a great deal of influence on the national scene, two – the Christian Democrats and Radicals – were in favour of circumspect development of nuclear energy, provided all necessary safety measures were adopted and the new power production technology was incorporated into an overall energy plan. The other parties, unable to muster a clear majority, left it to their members to reach a decision on the matter. Thus the division in the nuclear debate cut across traditional party boundaries.

At the same time, however, there was growing democratic activity on the part of the sovereign power. In several cantons, action by opposing committees resulted in the adoption of cantonal initiatives regarding nuclear energy. At national level, the initiative of one opposing committee resulted in the launching of *"a federal popular initiative to safeguard popular rights and safety in connection with the construction and operation of nuclear facilities"*. Since the four laws relevant to nuclear power plants had been passed at federal level, it did not appear that the cantonal initiatives would be legally acceptable. On the other hand, the federal initiative, which received some 125 000 signatures (50 000 would have been enough) and proposed an amendment to the Federal Constitution, was registered on 20 May 1976; this initiative is acceptable and will be put to the popular vote.

A crucial aspect of this initiative is the demand that the licence for a nuclear facility (a power plant or facility for producing, processing or storing nuclear fuel and radioactive

waste) should not be issued except with the consent of the electorate of the entire commune where the site is located and the neighbouring communes, and with the consent of the electorate in each canton whose territory is not more than 30 km distant from the nuclear facility concerned. Thus, contrary to the majority rule envisaged by the Federal Constitution, the initiative does not specify a majority of voters, but a majority of the electorate. In practice this requirement means de facto prohibition.

This turn of events naturally encouraged legislative action by the federal authorities and a Federal Commission of legal experts was given the task as early as the autumn of 1975, i.e. before conclusion of the federal initiative, of undertaking revision of the nuclear law. Hence the population will have to decide on the constitutional initiative, probably in 1978, and probably also on a legislative counter-proposal by the federal authorities.

INTERACTION BETWEEN CONTROL AND ACCEPTANCE

Because of the rift existing both within the population and between the population and the authorities, the licensing of power plants and other nuclear facilities has become a highly political issue; for this reason an adjustment of the decision-making machinery in this field is unavoidable. The Federal Commission, after considering all aspects of the legal situation, intends to carry out the revision in two stages, the first of which is aimed at settling the more urgent points and is due to take effect from 1978, while the second will be devoted to the more complex points, especially relations with the cantonal and communal authorities, and should take effect from 1980. Proposals for the action envisaged during the first stage are now being discussed in Switzerland.

First stage. The Commission proposes the following three amendments to the present requirements:

(1) The number of nuclear facilities should be limited to that essential for the country's power supply;

(2) The power of decision, in view of its highly political nature, should be vested in the Federal Assembly (an alternative envisaging the Federal Council as the decision-making authority has also been suggested);

(3) The population affected should be in a position to influence the licencing procedure.

Let us now consider these conditions in greater detail.

(1) The need for a nuclear power plant

The opinion that it should not be left entirely to the whim of the advocates of nuclear power to build nuclear power stations and that the number of such stations should be determined in terms of an overall energy plan is gaining ever wider public support. It is felt that no nuclear power stations should be built at all unless the energy they are to produce is really necessary to supply the country. Yet there is a tendency to build nuclear power plants at too fast a rate. Since nuclear facilities have given rise to so much controversy, this fact alone justifies constructing them only in response to a genuine need. Another reason for showing restraint is that the problem of radioactive waste disposal has not yet been solved in Switzerland, although the experts feel that a satisfactory solution can be found.

Under the terms of reference which the Department of Transport, Communications and Energy has given, with the consent of the Federal Council, to the Commission for an overall energy plan, the country's energy economy should be considered within its total context and not as something apart. Any attempt at controlling the economy by gearing it to a rigid energy policy should be ruled out. Under the terms of reference: "The general aim shall be to incorporate an optimum energy policy into the country's overall economic and social policy. Within this context consideration should also be given to the need to ensure adequate supplies of energy, provide job security, reduce Switzerland's political and economic dependence on other countries — or at least avoid unilateral dependence — protect human beings, preserve the quality of the environment and husband natural resources."

For the time being the interim report issued by the Federal Commission for the overall energy plan, which was published in May 1976 and was on the whole favourably received by the public, can serve as a basis for determining requirements. According to this document, the aim should not be to cover any and all energy requirements, but only those likely to remain when economy measures have had their effect. These measures are at present being examined. But there is no point in trying to save on energy by making certain energy sources artificially scarce, since that would only force the consumption of other types of energy. For example, a lack of electricity of nuclear origin would result in the increased production of electricity from oil-fired plants. A trend of that kind would run counter to one of the basic aims of the energy policy, which is to reduce the country's excessive dependence on oil, since oil already covers 75% of Switzerland's total energy requirements, the bulk of it is produced in a geographically limited zone, its reserves are limited, and lastly, it is a polluting energy source.

Hence we must not only economize on energy, but also diversify energy supplies by partly replacing oil by other energy sources. In determining future nuclear energy needs, consideration has also to be given to the need to replace, to some extent, oil products by electricity and to use the heat from nuclear power plants for district heating. Provision must also be made for reserves for dry winters when the production of hydroelectric power drops sharply, and also for scheduled or unscheduled shutdowns at nuclear power plants. Furthermore, the fact has to be considered that the Swiss electricity companies have secured the right to import electricity by co-financing nuclear power plants abroad and that, as a result, foreign companies cannot be refused the right to do the same in Switzerland so as to receive some of the power produced by Swiss plants. These imports and exports of electric current should also be taken into account when determining requirements.

In accordance with what has been said, the authority empowered to license the construction of nuclear power plants and to establish safety requirements should also be competent to determine whether the projected facility meets a need in terms of the overall energy plan and to assess the conflicting interests involved. The Commission's draft ordinance contains a provision on this point, according to which a general authorization would be introduced which could be either withheld entirely or made subject to certain conditions of obligations if predominant interests of the general public made that necessary, or if the planned facility did not meet a true need.

(2) Level of decision

The present procedure for considering an application for a federal nuclear facility licence is in the nature of a police requirement and is in the sole domain of the Department of

Transport, Communications and Energy. As already stated, the licensing of nuclear facilities has grown more and more markedly political in the course of the last few years by virtue of the opposition shown to nuclear energy. Allowance should be made for this trend by vesting a political authority from now on with the power of decision whether or not to grant a nuclear facility licence. It is a moot point whether the Federal Council or the Federal Assembly should be the one to enjoy this competence. The Federal Council would like both alternatives to be considered.

The Swiss political system, under which the Federal Council is responsible for the implementation of federal laws, militates in favour of the first alternative. A second argument is that in the Federal Council the procedure is more rapid than in the Federal Assembly. In view of the fact that the Swiss Parliament, composed of part-time deputies, is overloaded with work, one should logically avoid burdening it further without real need to do so.

Moreover, it has to be noted that the separation of legislative, executive and judicial powers has never been applied with absolute stringency. Administrative functions of great political significance have been assigned on numerous occasions to Parliament. One need only think of the granting of railway concessions, the licensing of new branches of the Swiss Federal Railways and decisions relating to the national highway network: all these tasks come under the competence of the Federal Assembly. As far as the political implications are concerned, the licensing of nuclear facilities is quite comparable with the powers enumerated above.

Parliamentary speeches, petitions and popular initiatives at cantonal and federal level call for a broader right of consideration by the people. But regional popular ballots taking the form of compulsory decisions, or even more recommendations, in connection with the implementation of a federal law would run completely counter to the Swiss system of public law laid down in the Federal Constitution. Furthermore, it would be difficult to delineate satisfactorily the region in which the ballot should be held. However, it would be possible to satisfy the demands made, to some extent, by assigning to the *Federal Assembly,* which represents the whole people, the power of decision in the matter of nuclear facility licensing. This alternative would have the advantage of giving the supporters and opponents a chance of publicly airing their arguments as part of the licensing procedure. Furthermore, it would help to keep the public informed and make for a better understanding of the decision taken.

A third solution would be to leave the decision to the *Federal Council at first instance* and make provision for *appeal to the Federal Assembly.* But this procedure at two levels would take up a great deal of time and cause delay. It might also lead to friction between the Federal Council and Federal Assembly. That is why this alternative has been discouraged from the very outset.

(3) Amendment of the examination procedure

Amendment of the procedure is also necessary in order to enable the population affected to exert greater influence on the decision-making. There can be no doubt that it is because the present law is not satisfactory in this respect that the construction of nuclear power plants has run up against political difficulties.

The proposal made by the Legal Commission only deals with the procedure in general terms. It provides for publication of the application for the general licence and affords those

concerned an opportunity of submitting their objections. Moreover, the consultation procedure, which is at the moment confined to the canton where the power plant is to be built, will henceforth be applied to the other cantons affected.

The following is added as a comment:

In view of the fact that the general authorization is granted only when the facility planned meets a specific need, deadlines for submission of applications for subsequent licences (building licence or partial building licence, start-up and operating licence) would also have to be stipulated. If these deadlines (which could be extended if required) were not adhered to, there would be grounds for revoking the general licence, thereby making way for another project.

The subsequent licences following the general authorization are technical documents. As matters stand at present, decisions relating to them are made at first instance by the Department of Transport, Communications and Energy on the basis of a delegation of competence; they are subject to appeal before the Federal Council. The Department makes a decision on the basis of expert advice supplied by the Federal Commission for Nuclear Facility Safety, which is helped by the Division of Nuclear Facility Safety of the Office for Energy Economy. These bodies may also have recourse to experts. Since the Federal Council cannot, in the matter of appeals, hope to rely on experts possessing broader knowledge than that of the bodies consulted by the Department, one might well wonder whether the possibility of appeal in these purely technical matters really makes any sense. This is why the Federal Council will have to consider whether it would not be better to revoke the delegation of competence to the Department so that the decision can be taken at one single instance. The parties concerned in the procedure would still be in a position to protect their interests by consulting the files and making known their desiderata. The latter could be gone into as part of the procedure and the Federal Council could make the decision.

The exceptions allowed in the procedure with regard to consultation of the files would obviously have to be respected. For example, plans and descriptions of facilities and action taken to prevent sabotage should not be discussed during the consultations for reasons of security.

Second stage. The second stage should deal with the problem between the Federal authorities in connection with the granting of federal authorization and the remaining cantonal authorities (for issuing the other two licences mentioned in this paper). But, as Rudyard Kipling used to say, that's another story!

This paper was presented at the International Conference on Nuclear Power and Its Fuel Cycle, 2–13 May 1977, Salzburg, Austria