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THE CANADIAN NUCLEAR SAFETY COMMISSION'S FINANCIAL GUARANTEE REQUIREMENTS

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ABSTRACT

The *Nuclear Safety and Control Act*[1] gives the Canadian Nuclear Safety Commission (CNSC) the legal authority to require licensees to provide financial guarantees in order to meet the purposes of the Act. CNSC policy and guidance with regard to financial guarantees is outlined, and the current status of financial guarantee requirements as applied to various CNSC licensees is described.

I. INTRODUCTION

The nuclear industry in Canada is regulated under the *Nuclear Safety and Control Act*[1] (the Act), which was passed in March 1997 and came into effect in May 2000. The Act establishes the Canadian Nuclear Safety Commission (CNSC) as the regulatory body in Canada for the development, production and use of nuclear energy. The CNSC comprises two separate bodies: the Commission itself, which acts as a regulatory tribunal, and the staff of the CNSC, which provides technical recommendations and advice to the Commission, exercises certain powers under the Act delegated to it by the Commission, and performs inspections and assessments to promote, verify and enforce compliance by licensees with the requirements of the Act, the regulations and licences.

The primary means of regulation used by the CNSC is licensing. Under section 26 of the Act, activities related to nuclear substances and nuclear facilities are prohibited except in accordance with a licence issued by the CNSC. As described in subsection 24(4), before issuing any licence the CNSC must first satisfy itself that:

> (a) the applicant is qualified to carry on the activity to be licensed; and
>
> (b) the applicant will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations.

The concept of "qualified" in (a) is a broad one. It includes not only technical qualifications related to the protection of health, safety, security and the environment, but also any other qualification that may be necessary to ensure that the applicant will have the necessary abilities and resources to meet its regulatory obligations. For example, certain activities may be sufficiently hazardous as to merit a requirement for certification of persons carrying out those activities (such as nuclear power plant operating staff). For complex activities, the applicant's management structure and organization may have an important impact on its ability to ensure safety, which is the underlying reason behind the CNSC's requirements related to quality assurance and management. In some cases, the applicant's access to financial resources may also be an essential qualification to ensure the ability to carry out the measures necessary to protect health, safety, security and the environment.

The importance of financial qualifications of licensees may extend further than assuring the licensee's ability to meet its regulatory and safety-related obligations. In some situations, failure by a licensee to secure the necessary financial resources to carry out an activity could result in an ongoing hazard on such a scale that the Government could find itself obliged to carry out actions to protect health, safety, security and the environment. This would result in the unexpected and unintended transfer of a financial responsibility from the licensee to the taxpayer.

As one means of controlling risks related to the ability of licensees to pay for the costs of protection of health, safety, security and the environment, and also as a means of controlling the potential financial burden placed on the taxpayer, the Act gives the CNSC the authority to require financial guarantees of licensees. In addition to the general authority to impose conditions in licences for the purposes of the Act, subsection 24(5) highlights in particular the authority to require a financial guarantee, as follows:

> "A licence may contain any term or condition that the Commission considers necessary for the purposes of this Act, including a condition that the applicant provide a financial guarantee in a form that is acceptable to the Commission."

This authority is supported by provisions regarding the Commission's ability to apply the proceeds of financial guarantees for the purposes of the Act (subsection 24(6)) and regarding the refund of unspent portions of such guarantees (subsection 24(7)).

In addition to the specific mention in subsection 24(5), the authority to require financial guarantees is distinguished from the CNSC's other regulatory powers in a number of other ways. For example, although section 44 of the Act contains a long list of regulation-making powers covering most of the CNSC's regulatory powers, there is no mention of financial guarantees in the list.

In fact, the only mention of financial guarantees in the Act other than in section 24 is among the obligations of designated officers. Designated officers are CNSC staff members to whom the Commission has delegated some of its licensing powers, as

described in subsection 37(2) of the Act. In the majority of cases, these delegated powers can be exercised without direct supervision from the Commission, the main exceptions being cases in which the "natural justice" rights of applicants to appeal to the Commission for a redetermination are involved. However, in addition to these natural justice situations, there is also a unique requirement on designated officers to report to the Commission after issuing any licence containing a condition requiring a financial guarantee (paragraph 37(5)(b)).

Taken together, the effect of these provisions of the Act is that each financial guarantee requirement will be considered on a case-by-case basis and imposed via a specific condition in each licence, rather than by means of a regulation which would apply uniformly to an entire class of licensees. In general, the application of financial guarantees is mainly (although not exclusively) to classes of licences which are normally issued and renewed by the Commission. In cases where financial guarantee requirements are imposed by designated officers, this can only be done with the Commission's knowledge (and by implication, consent).

According to subsection 24(5) of the Act, financial guarantees may be used for any purpose that falls within the purposes of the Act, i.e. the regulatory control of risks to national security, the health and safety of persons and the environment associated with the use of nuclear energy and nuclear substances.

Currently, when considering licence applications CNSC staff considers, *inter alia*, the risks to health, safety, security, the environment and Canada's international obligations that could ensue if the applicant became financially incapable of meeting its obligations under the licence. If such risks are considered significant, staff may recommend a requirement for a financial guarantee to protect against those risks.

In particular, it has been considered that the financial risks relating to decommissioning are sufficient, in the absence of justification to the contrary, to warrant requiring financial guarantees for decommissioning costs for uranium mines and mills and for nuclear facilities. As described later in this document, decommissioning financial guarantees are either in place or being developed for all of these facilities.

There is, however, one area where financial guarantees are not applied because of previously-existing legislation, namely the area of third-party liability for the consequences of nuclear accidents. Since the *Nuclear Liability Act*[2] already sets out requirements regarding third-party liability for injuries or damages to third parties arising from the use of nuclear materials at nuclear installations, the CNSC does not impose financial guarantees to cover this particular financial liability.

II. DECOMMISSIONING

The majority of financial guarantees requirements imposed to date in licences have been for the costs of decommissioning. The first financial guarantee requirements in Canada resulted from the near-failure of a uranium mining company in the early 1990s, which

almost caused the two levels of government (federal and provincial) to be left with substantial decommissioning costs at some shut-down uranium mines. These costs would have included the costs of rehabilitation of mill tailings management areas, as well as the dismantling of mine and mill structures and the closure of mine shafts. While these unanticipated costs to the taxpayer were in the end averted, it was recognized that a mechanism was needed to prevent similar occurrences in the future.

Subsequent to that event, financial guarantee requirements were imposed on uranium mine operators by regulation. However, it was not until after the coming into force of the *Nuclear Safety and Control Act* in 2000 that these requirements were extended to other licensees.

In order to establish the amount of a financial guarantee, it is necessary to have cost estimates which are based on a preliminary (or conceptual) decommissioning plan. The regulations[3], [4], [5] made under the Act require applicants for licences for all nuclear facilities, uranium mines and mills to submit preliminary decommissioning plans in support of applications for licences to prepare a site for, construct or operate these facilities. The contents of these plans are described in Regulatory Guide G-219[6], which explains that one of the requirements for preliminary decommissioning plans for construction and operating licences is to provide a cost estimate upon which a financial guarantee can be based.

The activities covered by preliminary decommissioning plans include not only decontamination and dismantling of the facility, but also all other activities and costs associated with the final portion of the facility's life cycle. This includes disposal of waste and, in cases where the end-state of a facility is not unconditional release from CNSC licensing, ongoing surveillance and maintenance.

In the case of spent nuclear fuel from reactors, the trust funds that are required under the *Nuclear Fuel Waste Act*[7] (NFWA) must also be taken into account. In order to avoid duplication, the amount of money in an NFWA trust fund that has been set aside for costs of long-term management of spent fuel for a nuclear power reactor is subtracted from the amount of the CNSC financial guarantee requirement for that reactor.

At the present time, the amounts of contributions to the NFWA trust funds are prescribed in section 10 of the NFWA. These contributions do not cover the full anticipated costs of spent fuel management. Even after a spent fuel management option is selected under the NFWA, the contributions under section 17 of the NFWA may not cover the full estimated costs for some time to come. To address this, the CNSC may require that estimated costs of spent fuel management which exceed the value of the NFWA trust fund must be accounted for in preliminary decommissioning plans and associated financial guarantees to the CNSC.

Once the preliminary decommissioning plan, including its cost estimates, has been accepted by the CNSC, the amount of an acceptable financial guarantee is known, and attention can be turned to the financial guarantee mechanism.

III. CNSC POLICY AND GUIDANCE ON FINANCIAL GUARANTEES

Shortly after the NSCA came into effect, the CNSC issued Regulatory Guide G-206[8], which sets out the CNSC's expectations for financial guarantees for decommissioning costs. This document is not prescriptive. It sets out performance criteria that any financial guarantee is expected to meet, but leaves it up to applicants to propose financial mechanisms that would meet those performance criteria.

The first of these criteria is liquidity. Any financial guarantee should be such that the funds it represents can be realized without undue delay. This does not mean that a guarantee would have to be in the form of cash; financial instruments which are easily negotiable can meet this criterion.

Financial guarantees should also be such that the vehicle can only be drawn upon with the prior acceptance of the CNSC. Prior acceptance does not necessarily mean prior approval. For example, the CNSC may accept in advance that withdrawals may be made to pay for expenses in accordance with a detailed decommissioning plan, without any need for CNSC approval of the individual withdrawals.

Another performance criterion for financial guarantees is certainty of value. This means that a financial guarantee consisting of investments whose value fluctuates unpredictably or is difficult to determine may not be found acceptable.

The adequacy of value criterion means that a financial guarantee is expected to be sufficient to fund the entire cost of decommissioning. Therefore sinking funds whose value is built up out of revenue received during the operating lifetime of a facility have not generally been found acceptable, since they do not address the possibility that the facility may not operate for its full intended lifetime leaving a shortfall in the accumulated funds.

The final performance criterion outlined in G-206 is continuity. This applies to mechanisms such as letters of credit, sureties or other security mechanisms with fixed terms. Such guarantee mechanisms can meet this criterion by including provisions for automatic renewal and for full payout without proof of forfeiture in the event of a decision not to renew.

When G-206 was written, the CNSC's only experience with financial guarantees was in the uranium mining sector, and G-206 was written mainly with uranium mining facilities and nuclear power plants in mind. Since that time, application of the criteria in G-206 to smaller nuclear facilities, and to costs other than costs of decommissioning, has resulted in the acceptance of financial guarantee proposals which differ from those envisaged in G-206.

For example, in the case of some quasi-public institutions such as universities, the CNSC has accepted sinking fund and self-guarantee methods for portions of the

decommissioning costs which are considered to be of low safety significance, on the basis of a very low risk of failure of the institution holding the licence. Application of the financial guarantee concept to situations with a low probability of occurrence (unlike decommissioning, which is guaranteed to be a requirement at the end of life of a facility) has led to other deviations from the criteria set out in G-206.

Another aspect of financial guarantees which was not addressed in G-206 was the question of present value versus constant-dollar value guarantees. In cases where financial failure of a licensee could reasonably be followed immediately by decommissioning, it is reasonable to expect that a financial guarantee should cover the full constant-dollar cost. If there are no changes to the facility or to the decommissioning plans, the only anticipated change to the amount of the financial guarantee would arise from increases in costs due to inflation. This eventuality has been dealt with by requiring periodic re-evaluation of cost estimates and the amounts of financial guarantees.

However, in situations where part of the financial guarantee is intended to cover long-term surveillance and maintenance costs, or in situations where the technical characteristics of the facility are such that it is inevitable that decommissioning will be prolonged, a constant-dollar guarantee would fail to take into account the time value of money. This could result in a substantial surplus value of the guarantee with the passage of time. In such cases licensees have proposed, and the CNSC has accepted, financial guarantees which are based on present value estimates of costs. These estimates take into account both anticipated increases in costs due to inflation and increases in the value of an invested guarantee such as a segregated fund.

In order to better address situations where the straightforward application of G-206 has proven problematic, the CNSC has initiated a project to prepare two new regulatory documents: a policy document on financial guarantees, and a guidance document which would replace G-206. These two documents would cover not only decommissioning but also other situations where financial guarantees might be required.

Given the case-by-case nature of the financial guarantee authority given the CNSC under the *Nuclear Safety and Control Act*, it is unlikely that either of these new regulatory documents will set out hard and fast rules for when financial guarantees will be required and what kinds of guarantees will be accepted. Rather, it is reasonable to expect that they will continue to be fairly general in nature.

IV. EXISTING AND PROJECTED FINANCIAL GUARANTEES

At the time of writing, decommissioning financial guarantees under the *Nuclear Safety and Control Act* are in place for most large- and medium-scale nuclear facilities in Canada. These facilities include nuclear power reactors, research reactors, nuclear fuel cycle facilities, uranium mines and mills, and waste management facilities.

The majority of financial guarantees for uranium mines, mills, processing facilities and fuel fabrication facilities are in the form of irrevocable standby bank letters of credit.

These letters of credit are usually valid for a period of one year, and are automatically renewed unless the bank notifies the CNSC in writing in advance of a decision not to renew the letter of credit. The beneficiary (usually the CNSC) can withdraw the funds unconditionally in the event of either of two conditions: (1) the licensee has failed to fulfill its decommissioning obligations (as determined by the CNSC); or (2) the bank has notified the CNSC that it does not intend to renew the letter of credit. The values of these letter-of-credit financial guarantees are reviewed periodically, typically every 5 years, in order to ensure that the effects of inflation and of changes at the facility are taken into account.

In the case of uranium mines in Saskatchewan, the beneficiary of the letters of credit is the province. This reflects the fact that the province is the landowner and will ultimately be responsible for ongoing care and maintenance of former mine sites within the province.

Research reactors owned by universities have in most cases set up a two-tier system of financial guarantees for decommissioning. The part of the overall cost that relates to highly safety-significant activities (removal of fuel and highly radioactive core components) is covered by guarantees in the form either of bank letters of credit or of segregated funds. Such segregated funds are accompanied by legal agreements between the owner of the fund (the licensee) and the CNSC, granting the CNSC access to the segregated funds in the event of a failure of the licensee to meet its decommissioning obligations.

For these facilities, those parts of the cost that are less safety-significant have been covered by self-guarantees from the university licensee, combined with a sinking fund that is intended to build up to the full amount over the projected lifetime of the facility. This relaxation of the criteria in G-206 was granted in recognition of the low financial risk posed by these quasi-public institutions.

With respect to nuclear power reactors, the three owners of nuclear power reactors in Canada have chosen to take separate approaches.

For Point Lepreau, a segregated fund has been established covering the full present value of the estimated decommissioning and waste management costs. The dates on which the present value calculation was based were founded on the assumption that the proposed project to refurbish the station is approved. If this refurbishment plan is not approved, there is a condition in NB Power's financial guarantee that will require the amount of the guarantee to be recalculated to take into account the changed shutdown date.

For Gentilly-2, Hydro-Québec has obtained a fixed-value financial guarantee from the province to the CNSC. The amount of this guarantee was calculated on the basis that it would be sufficient to cover the entire present value cost as of the expected shutdown date of 2013.

In Ontario, the owner, Ontario Power Generation Inc., has chosen to establish a single financial guarantee to cover all of its decommissioning costs, including spent fuel and waste management costs, for all of the power reactors and waste management facilities it owns. The power reactors leased and operated by Bruce Power Inc. are included in this list. The majority of the guarantee is in the form of a segregated fund, supplemented by a fixed-value guarantee from the province directly to the CNSC. The segregated fund is being built up rapidly, and it is anticipated that within a small number of years it will be sufficient to cover the entire estimated present value cost, at which time the provincial guarantee will no longer be required.

The first case in which financial guarantees for situations other than decommissioning were considered was that of Bruce Power Inc. Bruce Power does not own the stations it operates; rather, it leases them from Ontario Power Generation Inc. In order to cover a possible situation in which the licensee becomes financially unable to continue to operate its nuclear generating stations, the Commission requested an operational financial guarantee from Bruce Power.

Following the failure of British Energy, the arrangement that was finally accepted by the Commission was one in which the three major owners of Bruce Power Inc. supplied guarantees to Bruce Power in amounts sufficient to ensure that the licensee would have access to sufficient funds to complete a safe orderly shutdown followed by removal of fuel from the reactors. This arrangement is similar to arrangements that were established in the U.S. for merchant generating plants. The deviation from strict compliance with the criteria of G-206 was justified on the grounds of the financial stability of Bruce Power's owners, provincial ownership of and responsibility for the stations in the event of a failure on the part of the licensee, and the relatively lower likelihood of the triggering event as compared with decommissioning.

In the U.S., nuclear power stations are required by the regulations[9] to carry insurance to cover the costs of on-site cleanup after a postulated accident. With the exception of Hydro-Québec, which is self-insured for this risk, Canadian nuclear generating stations carry similar insurance even though it has not been a regulatory requirement. It has been proposed that the CNSC consider recommending making such insurance mandatory, through the imposition of licence conditions. This proposal is still under consideration.

V. COMPARISON WITH INTERNATIONAL PRACTICE

It is generally accepted practice internationally to require that financial provisions be made for the costs of decommissioning nuclear facilities and of disposal or long-term management of the wastes resulting from their operation and decommissioning. The *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*[10] (the "Joint Convention"), which came into effect in 2003 and to which Canada is a party, contains provisions relating to this topic. Each party to the Convention is required to take appropriate steps to ensure that adequate financial resources are available to support the safety of decommissioning and of facilities for spent fuel and radioactive waste management. One of the means by which Canada

demonstrates compliance with these requirements of the Joint Convention is through the CNSC's financial guarantees.

The International Atomic Energy Agency's safety standards documents, although not legally binding, reflect international consensus on nuclear safety requirements and practices. Compliance with these safety standards is considered one possible means of demonstrating compliance with the relevant requirements of the Joint Convention. Article 3.17 of WS-R-2[11], the current relevant Safety Requirements document, reads as follows:

> "A mechanism for providing adequate financial resources shall be established to cover the costs of radioactive waste management and, in particular, the cost of decommissioning. It shall be put in place before operation and shall be updated, as necessary. Consideration shall also be given to providing the necessary financial resources in the event of premature shutdown of the facility."

The first two sentences of this requirement are straightforward and can be met by the current financial guarantees in many countries including Canada. The third sentence, which is a suggestion rather than a requirement, can be more problematic. In a number of countries, financial guarantees in the form of sinking funds are accepted. To the extent that these arrangements are dependent upon future income, they may fail to provide the necessary resources in the event of premature shutdown. The "adequacy of value" criterion in G-206 is intended in part to address this point, by ensuring that financial guarantees do not depend on future income from operating the facility.

There are two other aspects of the cost of decommissioning in the event of premature shutdown which may also be of interest. One of these is due to the fact that many of the CNSC's financial guarantees are based on present value calculations and are therefore dependent on the time value of money. As long as premature shutdown does not result in a change to the dates of decommissioning activities, this will not be an issue. However, if the dates of decommissioning are brought forward due to a premature shutdown, there is a possibility that a present value financial guarantee could become insufficient. In the one financial guarantee where this is a significant concern in Canada, there is a specific clause to deal with this situation. The second such aspect is that of the costs of interim storage and surveillance between the time of shutdown and the eventual date of decommissioning. At present, the CNSC's financial guarantees do not include provisions for the contingent increases in storage and surveillance costs resulting from a premature shutdown.

There have been a number of surveys of financial guarantee arrangements in several countries[12-14]. There is considerable variation in the way this topic is approached in different countries. The detailed results of these surveys will not be repeated here, but descriptions of two cases of particular interest, namely the European Community and the United States, will be given.

The Council of the European Communities issued a proposal for a Council Directive on the broad topic of nuclear safety in early 2003[15]. As originally proposed, this would

have required European Community Member States to "ensure that financial resources sufficient to cover decommissioning costs of each nuclear installation, taking into account the length of time required, are available as decommissioning funds at the time envisaged". The European Economic and Social Committee subsequently recommended that this be revised to eliminate the requirement that the financial resources be available in the form of decommissioning funds, leaving that decision up to each individual Member State. This recommendation, if adopted, would result in a requirement which is broadly similar to the current CNSC practice.

In the United States, financial assurances for decommissioning costs are required by the regulations. This requirement includes not only nuclear power reactor and other major facility licensees, but also all materials licensees whose licences authorize the possession of large sources or large quantities of radioactive materials. Generally speaking, the regulations allow licensees to determine the amounts of financial guarantees in two ways: (1) on the basis of cost estimates from a decommissioning plan; or (2) in a default amount which is fixed in the regulations. The acceptable financial mechanisms are generally similar to those used in Canada, with the addition of corporate guarantees for certain types of licensees from companies (self-guarantees or parent-company guarantees) that meet financial criteria spelled out in the regulations[16]. As in Canada, financial assurances in the U.S. are normally expected to be prepaid or fully-funded. The major exception to this is nuclear power plants that are operating in financially regulated markets, which are allowed to use sinking funds built up over the operating lifetime.

As mentioned before, there is also a requirement in the US for nuclear power reactors to carry insurance to cover the costs of on-site post-accident cleanup[9]. In addition, the regulations give the NRC the authority to require financial information from licensees. This has been used in cases of privately-owned non-financially regulated nuclear power plants to ensure that sufficient funds will be able to pay for an orderly safe shutdown in the event the owner suffers financial difficulties.

VI. CONCLUSION

The Canadian Nuclear Safety Commission's financial guarantee requirements, policy and guidance have been described and compared with current internationally-accepted regulatory practice. The status of financial guarantee requirements in existing licences has been described. In general, the financial guarantee arrangements established to date under the Nuclear Safety and Control Act provide a level of protection which is similar to that afforded by current international best practice.

The CNSC's financial guarantee requirements ensure that adequate financial provisions for protecting health, safety and the environment are made throughout the life cycle of nuclear facilities and nuclear activities. In addition to ensuring that health and safety will be protected, these provisions also ensure that Canadian taxpayers will not be required to foot the cleanup bills in the event that a licensee encounters financial difficulties.

REFERENCES

[1] GOVERNMENT OF CANADA, *Nuclear Safety and Control Act*, S.C. 1997, c. 9.

[2] GOVERNMENT OF CANADA, *Nuclear Liability Act*, R.S. 1985, c. N-28.

[3] GOVERNMENT OF CANADA, *Class I Nuclear Facilities Regulations*, SOR/2000-204, s. 3(k).

[4] GOVERNMENT OF CANADA, *Class II Nuclear Facilities and Prescribed Equipment Regulations*, SOR/2000-205, ss. 3(s), 4(t).

[5] GOVERNMENT OF CANADA, *Uranium Mines and Mills Regulations*, SOR/2000-206, para. 3(a)(viii).

[6] CANADIAN NUCLEAR SAFETY COMMISSION, "Decommissioning Planning for Licensed Activities", Regulatory Guide G-219, Ottawa, June 2000.

[7] GOVERNMENT OF CANADA, *Nuclear Fuel Waste Act*, S.C. 2002, c. 23.

[8] CANADIAN NUCLEAR SAFETY COMMISSION, "Financial Guarantees for the Decommissioning of Licensed Activities", Regulatory Guide G-206, Ottawa, June 2000.

[9] U.S. NUCLEAR REGULATORY COMMISSION, "Conditions of licenses", *Code of Federal Regulations* Title 10, part 50.54(w).

[10] *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*, IAEA INFCIRC/546, Vienna, December 1997, Articles 22 and 26.

[11] INTERNATIONAL ATOMIC ENERGY AGENCY, "Predisposal Management of Radioactive Waste, Including Decommissioning", Safety Requirements WS-R-2, Vienna, 2000, para. 3.17.

[12] GF ENERGY, LLC, "Status of Financing Systems for High-Level Radioactive Waste Management (HLRWM)", Nuclear Waste Management Organization, Toronto, 2003.

[13] NUCLEAR ENERGY AGENCY, Proceedings of Topical Session on "Liabilities identification and long-term management at national level", NEA/RWM(2003)14, Paris, 13 March 2003.

[14] C.J. Hearsey, D. Emmery, P. Kunsch, W. Bollingerfehr, S. Webster, "The Financing of Radioactive Waste Storage and Disposal", European Commission EUR18185, October 1999.

[15] COUNCIL OF THE EUROPEAN COMMUNITIES, “Proposal for a Council (Euratom) Directive Setting out basic obligations and general principles on the safety of nuclear installations”, COM(2003)32, 2003/0021(CNS) Article 9, Brussels, 30 January 2003.

[16] U.S. NUCLEAR REGULATORY COMMISSION, “Assuring the Availability of Funds for Decommissioning Nuclear Reactors”, Regulatory Guide 1.159, Revision 1, October 2003.

[17] U.S. NUCLEAR REGULATORY COMMISSION, “Contents of applications; general information”, *Code of Federal Regulations* Title 10, part 50.33(f).