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**Statement of Paul L. Leventhal and Alan J. Kuperman
Presented to the
U.S. Nuclear Regulatory Commission
Briefing on Proposed Export of High Enriched Uranium to Canada
July 10, 2000**

Mister Chairman, and members of the Commission, we appreciate your convening this public meeting and inviting the Nuclear Control Institute to make a presentation. We are Paul L. Leventhal, president, and Alan J. Kuperman, senior policy analyst, at NCI. With your permission, and to avoid repetition, we would like to append to this testimony our letters to the Commission dated December 17, 1999, and May 9, 2000.

We are gratified by the close attention that the Commission is paying to ensure that the applicant fulfills its commitments to convert its medical isotope production from reliance on bomb-grade, highly enriched uranium (HEU) – which poses risks of nuclear proliferation and nuclear terrorism – to low-enriched uranium (LEU) that is unsuitable for weapons. Not only is this the crucial test case of relevant U.S. nonproliferation law (the Schumer Amendment to the Energy Policy Act of 1992) to come before the Commission, but the successful conversion of Canada's isotope production to LEU is essential to fulfilling the long-standing mission of the international Reduced Enrichment for Research and Test Reactors (RERTR) program, to phase out all remaining civil commerce in bomb-grade uranium. The successful conversion of Canada's program, the single largest commercial isotope production program in the world, will pave the way for universal implementation of this conversion norm.

Last Year's Commission Order

Just over a year ago, on June 29, 1999, the Commission issued a conditional approval of the applicant's request for a license to export 130 kilograms of HEU – a material that can be used to make nuclear weapons – over five years in the form of targets for production of medical radioisotopes. The Commission required that the applicant and the U.S. Executive Branch submit annual progress reports to the Commission on efforts to convert this isotope production to LEU, which is unsuitable for weapons. Such an active conversion program is required by U.S. nonproliferation law (the Schumer

Amendment) as one of several pre-conditions for HEU exports, which are permitted only on an interim basis prior to conversion to LEU. The Commission's order stated:

Upon examination of the reports, the Commission may hold a public meeting, if necessary to gather additional information. If the Commission should make a finding, following review of these periodic status reports and a public meeting, if necessary, that the requirements of the Schumer Amendment are not being met, the Commission may modify, suspend, or revoke the license . . .¹

Accordingly, this public meeting today is intended to gather additional information to assist the Commission in deciding whether to modify, suspend, or revoke the export license granted last year. The Commission's order further stated:

It is the Commission's understanding that ANL [Argonne National Laboratory] will be able to complete a [conversion] feasibility study promptly, within approximately three months of receiving the necessary technical information. The Commission further understands that AECL [Atomic Energy Canada, Ltd.] will cooperate fully with ANL to complete a feasibility study as soon as possible. In light of these commitments, the Commission is encouraged that AECL may have a feasibility study in hand in time to consider whether minor modifications could be made prior to the MAPLE reactors and their processing facility coming on line that would permit the use of LEU targets, or take other reasonable measures that would at least preserve the opportunity to move to LEU targets in the future.²

Positive Aspects of the Applicant's Response to the Commission Order

During the last year, the applicant carried out its own feasibility study, which determined that most aspects of its isotope production process can be converted to LEU targets with little or no modifications. The MAPLE reactors require no modifications to accept LEU targets for irradiation, although regulatory approvals would be required before such targets could be introduced to the reactors. Processing of targets at the New Processing Facility (NPF) entails three steps - dissolution of targets, extraction of molybdenum, and waste processing. The applicant's feasibility study found that the first two steps could be carried out on LEU targets in the NPF with only a modest increase in the liquid volume of the process flow, up to 1.7 times the volume used for HEU targets.

¹ U.S. NRC, Memorandum and Order, CLI-99-20, June 29, 1999, pp. 12-13.

² Ibid., p. 13.

The applicant reported in its feasibility study that only the final step in the NPF – the processing of waste from liquid to solid form – still presented an obstacle to conversion to LEU targets. This is due to three factors. First, the liquid volume of LEU waste might be up to 1.7 times that originally planned for HEU, potentially exceeding the capacity of the holding tanks for liquid waste prior to solidification (calcining) of the waste. This would mean that the liquid waste could not be allowed to decay as long before being solidified, which could increase the heat in the calcining unit. Second, because this LEU waste contains 1.7 times the liquid volume and five times the mass of uranium as HEU waste, the capacity of the existing calciner to solidify waste at a sufficient rate may be exceeded. Third, if the increased mass of uranium resulted in more waste containers, the capacity for storing dry waste eventually could be exceeded.³

In subsequent presentations, the applicant has indicated that the second of these concerns presents the only significant obstacle to conversion – i.e., the capacity of the calciner. As we understand it, the calciner converts liquid to solid waste by evaporating off the liquid. In order to maintain the same process rate and number of solid waste containers, the liquid would have to be evaporated more quickly, and each waste container would have to hold five times the mass of uranium waste. The mass of uranium is apparently the ultimate constraint, because the marginally higher liquid volume can be dealt with. As the applicant has stated more recently: "Research to date indicates that we must consider one key issue before converting. We must determine how to manage the increased solid waste in the NPF which would arise from the use of LEU targets. This concern can be described as a capability and capacity issue with the calcination process in the NPF."⁴

Most recently, the applicant has indicated that the findings of its feasibility study were overly pessimistic, and that LEU targets actually can be dissolved and processed in virtually the same volume of solution as HEU targets. As summarized by a recent ANL trip report, "Grant Malkoske (MDS Nordion) expressed his conviction that the MDS Nordion Mo-99 extraction process can be modified so that the volume of solvent required to process LEU targets is not significantly different from that required to process HEU targets."⁵ This eliminates the potential obstacles described above associated with a higher volume of process flow, meaning that the only issue to be resolved is how to deal with a higher mass of uranium in the waste.

³ MDS Nordion, "Report in Response to the Nuclear Regulatory Commission's Request That Argonne National Laboratory Prepare a Study of the Technical Feasibility of Converting the Maple Reactors and the New Processing Facility to use LEU rather than HEU Targets," Submitted to the U.S. NRC, April 17, 2000, Annex, pp. 5-6, hereafter referred to as "Nordion Conversion Feasibility Study."

⁴ Letter from Grant Malkoske, Vice President, Engineering and Technology, MDS Nordion, to Dr. Agnes Bishop, President, Canadian Nuclear Safety Commission, June 8, 2000, p. 2.

⁵ Letter from Armando Travelli to Patricia Dedik, "Report on Visit by ANL Personnel to SGN," July 7, 2000.

Thus, the single remaining question-mark about conversion is whether the calciner can be modified so that each waste container can hold a significantly higher mass of uranium – ideally five times as much, although a slightly smaller multiple would probably still allow for conversion to LEU. The technical problem as we understand it is that as the liquid evaporates, the waste solution becomes viscous and tends to bubble and spurt. As summarized in the ANL trip report, "The problem is caused by the increased temperature and viscosity that the solution would acquire when the uranium concentration reaches 1,500 grams per liter."⁶ The mass of uranium in each container is kept low to prevent any waste spurting outside the waste container. The technical question is whether there is any way to increase the mass of uranium in each waste container, while maintaining the same process rate and preventing such spurting out of the container. One possibility is the installation of baffles within each waste container. Another possibility is that the uranium could be chemically precipitated out of the liquid waste solution, which would reduce its viscosity and thereby reduce spurting during the evaporation and calcining process.⁷ If it is not possible to increase sufficiently the capacity of the existing calciner module, the applicant originally reported that the alternative would be to build a second calciner to process the extra mass of uranium waste. In its prepared testimony for today's meeting, the applicant now claims that the preferred fall-back if the calciner capacity in the NPF cannot be increased would be to build a second entirely new NPF at considerable expense.⁸

In short, the good news is that the applicant has determined during the past year that there are no obstacles to conversion of the MAPLE reactors and NPF to LEU targets except for the calciner capacity, which should be able to be resolved in short order if a good faith effort is made.

Troubling Aspects of the Applicant's Response to the Commission Order

The bad news is that the applicant was unresponsive to several aspects of the Commission's order during the past year. As cited above, the Commission's order expressed the expectation, based on assurances from the applicant, that the applicant would share information with Argonne National Laboratory that would enable ANL to complete a conversion feasibility study within three months after the Commission's order – i.e., by September 1999. Such expeditious completion of the feasibility study was intended to provide sufficient time for the applicant to make modifications to the NPF prior to its start-up in order to facilitate subsequent conversion to LEU targets. This was

⁶ Ibid.

⁷ "It appears that addition of an uranium-precipitating agent (such as oxalic acid or hydrogen peroxide) to the can where evaporation takes place might enable evaporation of most of the liquid of an entire batch in a single can without excessive temperature or viscosity." Letter from Travelli to Dedik, July 7, 2000, p. 2.

⁸ Statement of Grant R. Malkoske, MDS Nordion, to the NRC, July 10, 2000. "It may be preferable . . . to construct a duplicate facility if processing improvements in the NPF will not adequately deal with increased volumes of waste."

based on the assumption that modifications after start-up would be more expensive – because the facility would be radioactive – and more likely to interrupt production, so that conversion would be less likely to occur. Regarding the sharing of information, the Commission's order stated: "Although ANL informed the Commission that further technical information is required from AECL, we understand that no further confidentiality agreements are required in order to effectuate this transmission of information and allow ANL's work to go forward."⁹

During the past year, however, the applicant refused to provide the necessary information to ANL, preventing ANL from preparing any feasibility study. Instead, the applicant prepared its own feasibility study, but did not present it to the Commission until April 2000, ten months after it was requested, seven months after the Commission expected it to be delivered, and only two months prior to scheduled start-up of the NPF. After delaying preparation of the study in this manner, the applicant then argued that too little time was left for any modifications to be made to the NPF prior to start-up. Indeed, it identified one modification that could facilitate future addition of a second calcining module – installing an extra pipe prior to start-up – but rejected this option because it would require six months to obtain regulatory approval and complete the modification.¹⁰ Had the feasibility study been completed on time, in September 1999, this modification could have been completed by March 2000, well before start-up of the NPF. Similarly, had the feasibility study been completed on time, the applicant would have had at least nine months prior to start-up to work with SGN to resolve the question of the capacity of the existing calcining module, and perhaps to modify it prior to start-up, to facilitate subsequent prompt conversion to LEU targets. Thus, not only did the applicant blatantly fail to live up to its commitments to provide the necessary information to ANL, but by delaying the feasibility study it undermined the Commission's primary intent of enabling modifications to the NPF to be made prior to start-up.

This apparent dilatory strategy by the applicant is made more troubling by other evidence. According to the applicant's own progress report, it appears that the feasibility study was essentially completed by January 17, 2000, when AECL and Nordion held a meeting to "review results of conversion feasibility study."¹¹ Yet the study was not submitted to the Commission until three months later, which suggests that the applicant deliberately delayed submitting the study to the Commission so as to have an excuse for not making modifications to the NPF prior to start-up. Further, Nordion did not even

⁹ U.S. NRC, Memorandum and Order, p. 9.

¹⁰ "Nordion Conversion Feasibility Study," p. 6. Interestingly, in its prepared testimony today, the applicant provides a different rationale for not adding the pipe: that it would be cheaper to build a second, entirely new NPF than to add extra waste processing cells to the existing NPF. See Statement of Grant R. Malkoske, July 10, 2000, p. 2.

¹¹ MDS Nordion, "Yearly Status Report to the USNRC on the Progress of the Program and Canadian Co-operation in Developing LEU Targets for the Maple Reactors," May 31, 2000, p. 5, hereafter referred to as "Nordion Annual Progress Report."

propose a "preliminary conversion development program" until May 2000,¹² even though the Commission expected this to begin in 1999 and Nordion has said repeatedly that it is committed to expeditious conversion.

After refusing for more than a year to provide ANL the necessary information to prepare a feasibility study, Nordion now touts its own "voluntary preparation" of a "report to the Commission on a matter that the Commission entrusted to ANL." Indeed, Nordion inexplicably claims that its own much belated preparation of a feasibility study – necessitated by its refusal to abide by commitments to provide information to ANL – is evidence of Nordion's "strong commitment to the expeditious and definitive conclusion of this project to convert" to LEU targets. This is positively Orwellian. Nordion further claims that it will now "await ANL's preparation of its own feasibility study, as required by the Commission," as if it were ANL rather than the applicant who is responsible for ANL's study not being prepared to date. If ANL does now prepare such a feasibility study, it will be completed more than one year late, owing exclusively to the malfeasance of the applicant.¹³

Unfortunately, this failure of the applicant to live up to a prior commitment on conversion repeats a troubling pattern established over the last decade. The Commission will recall that as early as December 1990, nearly ten years ago, AECL declared in support of a license application for export of HEU that it was committed to develop an LEU target by 1998 and to "phase out HEU use by 2000."¹⁴ Despite this early commitment, the applicant intentionally designed the NPF to handle a process flow and level of waste adequate for HEU targets but which it knew would be inadequate for LEU targets. Subsequently, in September 1997, in support of another license application for export of HEU, Canadian representatives signed an exchange of notes, again committing to develop and convert to LEU targets. But, more than a year later, when the applicant submitted still another application for export of HEU (the license now under review), there was still no progress on conversion. As the Commission noted in last year's order, "At the time NCI filed its pleadings with the Commission [in December 1998, petitioning to intervene in the license currently under review], the continuing existence and extent of an active program to develop LEU targets for use in the MAPLE reactors were not readily apparent."¹⁵

Recommendations Regarding the Commission's Authority to Modify, Suspend, or Revoke the License

The Nuclear Control Institute offers the Commission several recommendations for carrying out its statutory authority to modify, suspend, or revoke the license currently

¹² *Ibid.*, p. 2.

¹³ *Ibid.*, pp. 6-7.

¹⁴ J.B. Slater, General Manager, Major Facilities Business Centre Operations, AECL Research, "The Program on Future HEU Supply for AECL's Radioisotope Production Operation," December 4, 1990, submitted in support of XSNM-02667.

¹⁵ U.S. NRC, Memorandum and Order, p. 7.

under review. Because the applicant has repeatedly violated aspects of its commitments to the Commission, and indeed undercut the primary intent of the Commission's most recent order – to enable modifications to be made to the NPF prior to start-up – our primary recommendation is for the Commission to establish stricter conditionality in the license. The Commission should modify the license to require that the applicant develop and adhere to a strict timetable for conversion in order to continue to qualify for exports of HEU under the license. There is ample precedent for such conditionality. In a recent exchange of notes with the EU regarding the Petten research reactor, the United States agreed to export HEU fuel for the reactor on an interim basis during conversion, in return for the EU and the reactor operator committing to convert to LEU as quickly as possible and to cease using HEU no later than 2006. In regard to the present license, we believe the timetable for converting the applicant's production of isotopes to LEU targets should be shorter, but the basic principle is the same.

We would note that the Commission's order last year expressed the expectation that completion of the feasibility "study will enable Applicants to . . . set a meaningful schedule for conversion."¹⁶ Despite this, the applicant initially refused to establish such a schedule after completing the feasibility study. Indeed, the applicant stated at the end of May 2000: "It is difficult at this time to provide firm dates for meeting project milestones for Phase 2 and the follow-on Phase 3, involving implementation of the LEU conversion program. . . . Therefore, it appears advisable not to attempt to specify precise dates for the initiation or completion of the Preliminary Conversion Development Program or the implementation of the Conversion Program."¹⁷ What is, in fact, inadvisable, given the applicant's track record, is to continue providing it HEU without first insisting that it establish and stick to a firm timetable for conversion.

It is essential that the timetable be as expeditious as realistically possible in order to prevent the applicant from further foot-dragging. Insight on what a realistic timetable for expeditious conversion should look like can be drawn from a variety of sources. The entire conversion process constitutes a series of discrete tasks, some of which already have been at least partially completed and some which can be performed in parallel: (1) developing an LEU target, (2) modifying the NPF if necessary, (3) obtaining Canadian regulatory approval for use of the LEU target in the Maple reactors and NPF (including environmental assessments, safety analyses of neutronics and chemical processes, and waste permits), (4) obtaining approval of the U.S. Food and Drug Administration (FDA), and its Canadian counterpart (Health Canada), of the isotopes produced with LEU targets.

In the past two weeks – apparently as the result of scrutiny from the Commission, ANL, and the U.S. Executive Branch – the applicant has begun to lay out elements of a timetable for conversion. Indeed, the calling of this meeting by the Commission apparently already has had a salutary impact on the applicant's level of cooperation. Just 10 days ago, the applicant finally arranged a meeting between itself, ANL, and the French company that originally designed the waste processing unit of the NPF, to discuss the

¹⁶ U.S. NRC, Memorandum and Order, p. 9.

¹⁷ "Nordion Annual Progress Report," pp. 7, 10.

potential for conversion to LEU. Until then, "Argonne believed it had insufficient information to evaluate the difficulty of the waste problem or to recommend a solution," according to the prepared testimony of the Executive Branch. However, as a result of the recent meeting:

Argonne, Nordion and AECL have agreed on the following time-line for moving forward on conversion which involves three steps: The first step is development of a plan by Nordion for resolution of remaining obstacles to conversion, to be completed by September of this year. The second step is technical implementation of this plan, which could require about 18 months. The third step involves safety approvals and environmental impact statements, which could require 3 years or more.¹⁸

The amount of time indicated for each step in this timetable is generous. However, we are most concerned that the Commission and the applicant may infer from the wording above that these three steps should be conducted serially. To the contrary, there is no reason that the three identified steps cannot be conducted concurrently. For example, the applicant already has sufficient information about the new LEU target to begin preparing the safety and environmental analysis for introduction of the target into the MAPLE reactors. The applicant also soon will have sufficient information about any required changes to the calcining unit to begin preparing safety documentation for its conversion. Thus, the total timeline for the three identified conversion steps would be no longer than the that for the longest step – obtaining regulatory approvals, estimated to require three years. We would also note that the time allotted for regulatory approval appears quite generous, considering that the modifications required for conversion are in most cases trivial. Indeed, the applicant generally will have to modify only slightly the documentation that it originally prepared to gain regulatory approval of the MAPLE reactors and NPF. Modification of this documentation will require considerably less time than was required to compose it in the first place, so that obtaining regulatory approval for use of LEU targets should require considerably less time than it did for HEU targets.

The applicant in the past reported that the Canadian Atomic Energy Control Board (AECB), which has since been renamed the Canadian Nuclear Safety Commission (CNSC), "indicated its expectation that at least three years will be required for AECL to conduct analyses, tests, and assessments of operating conditions in order to demonstrate to AECB that AECB regulatory conditions have been satisfied."¹⁹ We called Dr. Aly Mortada Aly of the CNSC to confirm this information. He reports that the CNSC believes that the entire Canadian regulatory process will require three years – from the

¹⁸ Views of the Executive Branch on Application XSNM03060, July 10, 2000, p. 3.

¹⁹ "Nordion Conversion Feasibility Study," p. 4. This claim is reiterated today in Statement of Grant R. Malkoske, July 10, 2000, p. 1.

beginning of LEU target development through final approval of the use of LEU targets.²⁰ However, the applicant reported in May 2000 that "AECL's preparation of an LEU target design for the MAPLE reactor was a major accomplishment of the LEU conversion program during the past year."²¹ Thus, the three-year timetable discussed by Canadian regulatory officials has already started – during the past year. In other words, the CNSC expects that all Canadian regulatory approvals can be granted less than three years from today if the applicant proceeds in good faith. This means that the total timetable for the three identified conversion steps should be less than three years.

On top of this period of less than three years must be added the time required for FDA approval. In response to a question at last year's NRC public meeting about the length of time for FDA approval, Dr. Trevena of Nordion said: "I am not sure there's a typical process. It could be six months. It could be a year."²² However, it appears that FDA approval for the new HEU targets to be used in the MAPLE reactors will have to be obtained in nine months or less. According to Dr. Trevena's testimony, the FDA approval process cannot begin until targets are actually processed in the NPF. But the NPF is not due to start up until later this summer. And Nordion must get FDA approval for the isotopes produced in the NPF from MAPLE targets before production ceases at the NRU. According to Nordion, "the availability of the NRU and its processing facility to supply medical isotopes will end by approximately the Spring of 2001, because the fissile liquid waste storage capacity of that facility will be reached."²³ Thus, Nordion apparently plans to get FDA approval in less than nine months – in between starting the NPF this summer and halting production at NRU by next spring. This indicates that FDA approval requires less than nine months, when an applicant is sufficiently motivated. Although initially there was some concern as to whether isotopes produced with LEU targets could obtain FDA approval as quickly due to possible higher levels of transuranic impurities, the applicant now appears confident that there will not be higher levels of such impurities in the finished isotopes produced with LEU targets. Moreover, the applicant has stated that "it strongly desires to successfully complete all Phases of this project and accomplish the conversion objective in the shortest time possible."²⁴ We ask only that you hold the applicant to this latest commitment.

In this context, it should be noted that the applicant's latest assertions about the remaining life of the NRU processing facility directly contradict its testimony of last year. At last year's public meeting, the applicant argued against any delay in starting up the NPF, to permit modifications to be made, on grounds that the NRU would reach capacity by the end of this year. Iain Trevena of Nordion stated that "with respect to NRU we have a storage tank that's used to contain our high-level fission waste. That

²⁰ Personal communication of Alan J. Kuperman, NCI, with Dr. Aly Mortada Aly, CNSC.

²¹ "Nordion Annual Progress Report," p. 6.

²² Transcript, "Briefing on Proposed Export of High Enriched Uranium to Canada," U.S. NRC Public Meeting, June 16, 1999, p. 31.

²³ Statement of Grant R. Malkoske, July 10, 2000, p. 2.

²⁴ "Nordion Annual Progress Report," p. 8.

storage tank will be filled by the end of the year 2000."²⁵ NCI pointed out that the capacity of the tanks had been increased previously and might be able to be increased again to extend isotope production at the NRU while modifications were made to the NPF. But John Matthews of AECL insisted that "there is a technical barrier and that is the waste tanks will be full at the end of the year 2000."²⁶ Remarkably, only a year later, the applicant's story has changed. Now it asserts that the NRU waste tank will not reach capacity until "approximately the Spring of 2001." This is unfortunately another indication that the applicant has played fast and loose with the facts, apparently to provide excuses for not making modifications to the NPF prior to start-up, as the Commission had intended.

In sum, it appears that all Canadian and American regulatory approvals for converting the applicant's isotope production to LEU targets can be acquired within approximately three and a half years from today – i.e., less than three years for Canadian regulatory approval and less than nine months for FDA approval – if the applicant pursues them expeditiously. We urge the Commission to require the applicant to present to the Commission within three months a timetable for expeditious conversion to LEU targets. We further urge the Commission to submit this timetable, once received, to independent review by ANL, to ensure that it represents an expeditious schedule, and to public review in the Commission's Public Document Room. Again, our expectation is that the timetable would provide for the completion of conversion to LEU targets within three and a half years from today. We further urge the Commission to make clear to the applicant that should it fall significantly behind on this conversion schedule, once submitted, during the course of the current license without the existence of legitimately extenuating circumstances, the Commission will act to terminate the license. We note that based on our estimates above, the applicant would complete conversion to LEU after using HEU for less than three and a half years of the five years originally anticipated in the license. This would serve to minimize exports of HEU as required by U.S. law and policy.

Our second recommendation regards the total amount of HEU approved for export under the license. The total amount in the current license is 130 kilograms, premised on the applicant's originally expressed need for 26 kilograms annually for five years. More recently, however, the applicant told the CNSC that "the annual consumption of HEU for molybdenum-99 targets is estimated to be 20 kg/year for a total amount of 100 kilograms over five years."²⁷ To avoid export of any HEU surplus to the applicant's needs, in accordance with U.S. law and policy, we urge the Commission to modify the current license immediately to reduce the total amount of HEU under the license from 130 to 100 kilograms. Moreover, it should be noted that if the applicant converts to LEU targets expeditiously, requiring less than three and a half years as explained above, the applicant would actually need no more than 70 kilograms of HEU targets to be imported under the life of the license.

²⁵ Transcript, pp. 14, 32.

²⁶ Transcript, p. 43.

²⁷ Letter from Grant Malkoske, June 8, 2000, p. 3.

Our third recommendation regards the fact that the conversion feasibility study still is not complete because no solution has yet been found to the capacity problem of the calcining module. It appears that a solution to this problem can be found within a few months at most, if the applicant has sufficient motivation to make a good faith effort. One way to provide the applicant this motivation would be to suspend the license for HEU exports until the applicant completes this last aspect of the feasibility study. In this manner the applicant would be compelled at least to complete the feasibility study prior to starting up the NPF, even if no modifications actually were made. The Commission has considerable influence in this regard, owing to the fact that the applicant apparently did not transfer any HEU targets under the license last year,²⁸ and thus does not yet have any targets to begin irradiating. Were the Commission to suspend the license until the applicant completed this final aspect of the study, the applicant would have strong motivation to do so expeditiously. We believe that with such motivation the applicant could complete this final aspect of the feasibility review in less than two months, at which time it could transfer HEU targets from the United States and commence isotope production in the new MAPLE reactors and NPF. Such a schedule would permit isotope production to begin at the new facilities by September 2000, well before it must stop at the existing NRU facilities in Spring 2001 due to the waste tank reaching capacity, thereby avoiding any interruption in the supply of vital medical isotopes. Such a license condition might appear punitive, but there is an urgent need to convey to the applicant that its flouting of Commission orders has consequences.

Finally, our fourth recommendation is for the Commission to insist that the applicant provide a better blueprint for how conversion is to be accomplished after start-up without interrupting production of isotopes. The applicant testified last year that such conversion would, in fact, result in such a production interruption, in part because the facility's pipes would have to be cleaned out for safeguards accounting purposes.²⁹ As we have stated previously, such potential interruption may be cited as an excuse for not converting, because of the risk of interrupting the supply of vital medical isotopes. It may be possible, through ingenuity and technology, to carry out conversion after start-up without such an interruption. For example, the French company that designed the waste processing unit for the applicant apparently claims that one potential aspect of conversion – adding a line to introduce a precipitating agent into the calciner – "would not present special difficulties even after the facility had begun operation with HEU."³⁰ The Executive Branch in its prepared testimony today makes the bold claim that, "Nordion has concluded that there are no modifications that need be done now while the facility is cold that could not be done later after the facility is hot."³¹ We have never seen such an explicit claim from the applicant. If the applicant indeed has an overall plan for carrying out conversion of the NPF after its start-up without interrupting the supply of vital medical isotopes, the applicant should be required to present it to the Commission. If the

²⁸ *Ibid.*, p. 4.

²⁹ Transcript, pp. 28, 38.

³⁰ Letter from Travelli to Dedik, July 7, 2000, p. 2.

³¹ Views of the Executive Branch on Application XSNM03060, July 10, 2000, p. 3.

applicant does not yet have such a plan, it should be required to develop one and then present it to the Commission. Otherwise, the Commission runs the risk – as we testified at last year's hearing – of path dependency. That is, once the facilities begin operating on HEU, the applicant may cite the risks of interrupting production and costs of conversion as grounds for using HEU in perpetuity. Indeed, the applicant reiterates in its viewgraphs today that conversion will occur only if it is "economically feasible."³²

In closing, we wish to underscore the importance of this case for the larger U.S. and international policy goal of eliminating civil commerce in bomb-grade uranium. During the past two decades, international commerce in HEU for use as fuel in research reactors has declined significantly, owing to nearly universal embrace of the conversion norm, but progress has been slower with regard to HEU commerce for isotope production. The applicant is the single largest producer of medical isotopes in the world. Thus, if it converts successfully from HEU to LEU targets, it will pave the way for adherence to this nonproliferation norm by remaining isotope producers not yet committed to conversion. Indeed, a number of such producers have expressed interest in conversion, but also have expressed concern about the lack of a level playing field that permits the largest producers to continue relying on HEU targets. Once the largest producer converts to LEU targets, the Commission and the Executive Branch can work together to ensure that this norm is adopted universally. Indeed, we expect this topic to be addressed at the annual meeting of the international RERTR program, in Las Vegas, from October 1-6, 2000, organized by ANL. The Commission may wish to send a high level representative to this meeting – or one or more of the Commissioners may wish to attend themselves, as has occurred in the past – to facilitate this international nonproliferation effort to phase out remaining civil commerce in bomb-grade uranium.

Thank you for this opportunity to present our views.

³² See viewgraph entitled "Conversion Development Program Next Steps (Cont'd)."