Submissions Received during Public Consultation on the Technical Assessment Report:
NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid/
Mémoires reçus lors de la consultation publique sur le Rapport d'évaluation technique:
Conception du colis NAC-LWT pour le transport de solution liquide de nitrate d'uranyle hautement enrichi

Please note comments submitted are posted in the official language in which they were received.
/ Veuillez noter que les commentaires soumis sont publiés dans la langue officielle dans laquelle ils ont été soumis.

- Pat Gibbons
- Neale Hunt
- Steve Staniek (1)
- Steve Staniek (2)
- Northwatch (1)
- Northwatch (2)
- Northwatch (3)
- Northwatch (4)
- Northwatch (5)
- Vic and Gail Macks
- Monika Schaefer
- James Deutsch
- Lake Superior Action Research Conservation
- Evelyn Gigantes
- Veronica Dahl
- Jim Penna
- Kate Chung
- Richard Denton
- Wendy Ounpuu
- Libby bobiwash-waikqukmic
- J. Lennox
- Darlene Buckingham
- Judi Poulson
- KA Smith
- Evan Edinger
- Pegg Campbell
- Tim Seitz
- Michele Anderson
- Marvin Resnikoff
- Gordon Edwards
- Kay Cumbow
- R. Johnson
- Barbara Pulst
- Corina Psarrou-Rae
• Marilyn Field
• Kevin Kamps
• Michael J. Keegan
• Robert Vetter
• Joanne D’Antonio
• Jane Danjin
• Frank Belcastro
• Lorraine Rudolph
• Shannon Rudolph
• Mary Olson
• Mary Ann Baer
• Donna Harden
• Ernest Goitein
• Paula Colby
• Sally O’Connor Peck
• Libbe HaLevy
• Nancy Nolan
• Durham Nuclear Awareness
• E Gogol
• Susan Michetti
• David Bear
• Ruth Thomas
• Citizen’s for Alternatives to Chemical Contamination
• Regina Birchem
• Marvin Lewis
• Nick Thabit
• Ace Hoffman
• Cecile Pineda
• Kathleen Ferris
• The Provincial Council of Women of Ontario
• Alliance for a Green Economy * Citizens’ Environmental Coalition * Citizens for Alternatives to Chemical Contamination * Nuclear Information and Resource Service * Savannah River Site Watch * Sierra Club Atlantic Chapter
• Ruth MacLean
• Scott Bailey
• Serpent River First Nation
• Sherron Moorhead
• Megan Leslie MP and Brian Masse MP
I read with interest and concern that the CNSC is about to consider approval of the transportation of highly radioactive substances on roads, railways and/or waterways in Canada.

Prior to responding to the latest CNSC request for comment, I have some questions to which I am requesting answers:

1. Since 2002, how many shipments of highly radioactive used candu fuel have been carried out in Canada?
2. Since 2002, how many shipments of parts of highly radioactive used candu fuel bundles have been carried out in Canada?
3. Are Canadian citizens along transportation routes notified in advance of the transportation of a) used nuclear fuel; b) highly radioactive liquid elements; c) intermediate level radioactive waste through their communities by airplane, water, rail and/or road transporting?

I require this above information to provide me with the opportunity to adequately respond to your request for comment on technical assessment of HEUNL transport package design by the designated date.

With respect,

Pat Gibbons
Sent from my iPad
January 1, 2015

Comments on Technical Assessment Report NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid

Following are my comments on the above named document. I have not reviewed the safety analysis supporting the conclusions drawn in the CNSC Technical Assessment Report.

Regards

Neale Hunt

Page 8: Table 1

1. How is the maximum U-235 content of 7.4 gU/L to be complied with during package loading?
2. What is the risk of the 7.4 gU/L value being exceeded during package loading?
3. What is the accuracy of the measuring devices used to confirm compliance with the 7.4 gU/L value?

Page 9: Section 2.4

4. Are the “Accident Conditions of Transport” defined in the IAEA Regulations bounding for all credible accident scenarios associated with the transport of this material?
5. What accident cutoff frequency is assumed for determining which accidents are credible?

Page 13: Section 2.6.1

6. The analysis assumes thermal expansion is not an issue because the inner containers are only partially filled. How is this conclusion affected by human error resulting in overfilling of the containers?

Page 16: Table 4

7. It looks odd that the dose rates are lower for the accident conditions of transport, especially considering that the analysis assumes loss of neutron shielding and deterioration of the gamma shielding. Please clarify.

Page 16: Section 2.9

8. The fourth paragraph says the criticality analysis is done for a package array with ‘optimum interior and exterior moderated array’ for accident conditions. Does this include a package filled with water, a package immersed in water, and a flooded package array? Please clarify.

Appendix A, Page 7, 2nd paragraph
9. Radiation protection programs are usually designed to limit worker doses to values below the regulatory criteria. It would not be acceptable in Canada for worker doses to challenge the regulatory limits for planned activities.

10. Do the dose assessment and anticipated worker protection processes comply with CNSC ALARA requirements? Is this determination made when a License to Transport is requested?

11. Table 4: The worker dose list is not comprehensive.

For example, workers at the shipping end (CRNL) whose jobs are to attach the filled packages to the transport truck will likely receive substantially higher doses than the driver due to their closer proximity to the package and the likelihood that the same workers will be loading every truck. Similarly for the workers at the receiving end.

Additionally, the driver will do more than just stay in the cab for the entire journey – the effects of en-route load inspections, rest stops, and refuelling stops should also be factored in.

Finally, there are other workers to consider, such as those working at truck inspection stations, refuelling stops, and the workers providing security during transport.

Appendix A, Page 8, 2nd complete paragraph

12. What is the basis for the 0.033 percent of inventory release following a severe accident? The text points to the IAEA Regulations as the basis for this value; however, I can’t find this number in those regulations.

13. I also can’t find a definition of ‘severe accident’ in the IAEA Regulations to which the 0.033 percent value is stated to apply. I presume a severe accident is one with severity greater than that associated with the ‘Accident Conditions of Transport’ defined in the IAEA Regulations. Assuming this is the case, I would expect higher releases from a potentially damaged container, which leads back to (9) above.
The most important piece of information has unfortunately been omitted in this message. Who owns the HEUNL? What is the ownership trail of this material, specifically: where did it originate, how has it's ownership changed over time, and who owns it now?

many thanks,
Steve Staniek
Dear Mr. Faille,

Thank you for taking the time to provide a detailed reply. Access to detailed information is vitally important to ethical Canadians, especially those of us who have worked as nuclear watchdogs locally, serving hundreds of Canadian communities for decades. In order for us to continue to be engaged in improving nuclear regulation in Canada, we need better cooperation from the regulator, and that includes gaining access to detailed information about how Canada's nuclear materials are actually being managed.

Canada's Information Minister, (Suzanne Legault) encourages Canadians to ensure transparency and accountability in government through individual access to information, "Every person in Canada has the right to request access to government records." I believe, that it's especially important for Canadians to keep the doors to our democratic government open to the public at this unstable time, when the political agenda being imposed on Canada by the PMO is unfortunately forcing the Canadian government into darkness and silence. The scientific opinions of the people in government that we need to hear from the most at this time are being silenced and suppressed by a special interest PMO that wants to hide its questionable agenda for Canada.

Nevertheless, I have a few comments regarding the way this issue has been presented to the Canadian public.

In all of the notices I have read, the CNSC has omitted vital information, which I feel should be presented in every public notice on this very important issue. Instead, it looks like the regulator is taking the path of least public resistance (LPR) to win public approval for its initiatives, when it omits important information that is highly relevant to public issues, namely:

- clear indication of ownership of nuclear materials; the word 'import' is ambiguous, and is not a reliable indicator of ownership.
- providing an up-to-date, full description of the nature of nuclear facilities, there seems to be a regulatory campaign to make some reactors more acceptable to communities by playing down the nuclear risks arising from their true operations. Some non-power reactors for example, have been converted to 'radioisotope factories' long ago out of financial necessity, and the production of radioisotopes dominates their agenda, and
they are 'research reactors' in name only.

- clear indication of the nature of the nuclear material. In this particular case, I just learned from your latest message to me alone, that the HEUNL is actually "target" material, and not nuclear fuel.

Many years ago I worked on preparing, and shipping Mo-99 'targets' to AECL. Not all isotopes are medical isotopes, and even those that are used primarily for medical applications have non-medical applications as well. Radioiodines for example are used in many non-medical applications. Tc-99m is used for other other purposes as well. To use the blanket cover of 'medical iosotopes is to misrepresent their true applications outside the medical world.

It is my hope that my messages will help the regulator reach a better understanding of how its work and agenda is perceived, and received by Canadians.

In the interests of better nuclear regulation, and non-toxic governance,
Steve Staniek
Subject: Questions with respect to Technical Assessment Report on HEUNL transport package design and its review

Importance: High

Thank you for your message of December 23rd, advising of the public comment deadline for the Technical Assessment Report on HEUNL transport package design.

We have the following three questions related to this notice and the review:
- what is the CNSC decision point, and who will the decision-maker be? When do you anticipate the decision being made?
- may we be provided with a copy of "CNSC Transport Package Certificate for the NAC NAC-LWT Package, CDN/E173/-96 (Rev. 8)"? Is it the most current version of a CNSC certificate for this shipment type?
- Will the CNCS make staff available for an on-line discussion of the Technical Assessment Report, if requested?

Thank you for your attention and timely response to these questions.

Regards,

Brennain Lloyd
Sylvain,

The "Technical Assessment Report: NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid" includes a statement that:

"The CNSC has not yet received an application to transport or export HEUNL to the U.S. Prior to the approval of any shipments of HEUNL in a certified package, the CNSC will ensure that all regulatory requirements are met. These requirements include the approval of a transport security plan by the CNSC for these shipments, that there is an Emergency Response Assistance Plan approved by Transport Canada in place, and that a CNSC export licence has been issued."

What will the review process be for the application to transport or export HEUNL to the U.S? In particular, will the public have the opportunity to review and comment on that transport/export application?

Thank you.

Brennain Lloyd
Thank you again, Sylvain. So, in the interim, I will direct any questions to you. I hope that you are the appropriate contact.

Slides from a recent meeting at the Savannah River Site (posted at http://www.srs.gov/general/outreach/srs-cab/library/meetings/2014/nm/lbasinupdate_mmaxted.pdf) describe, on Slide 8, shipments from AECL. The points are as follows:

AECL has NRU/NRX fuel that is longer and heavier than typical Material Test Reactor Fuel
• Contract signed in 2012 where prepayment of $10 Million made for the modifications to be made for receipt of the fuel in L-basin
• Modifications to the Shielded Transfer System (STS) are required to remove the fuel from the LWT cask.
• New unloading station developed to remove the fuel from the basket and load it into bundles for storage in L-basin.
• Fabrication of the STS modifications are expected by end of Calendar Year 2014
• Receipts expected to begin in March 2015. • Multi-year shipping campaign
• No other modifications are expected for typical MTR Fuels.
• All non-typical MTR fuels will be evaluated on a case-by-case basis.

Can you please confirm - or correct - my impression that this slide is in reference to the same shipments as are being referenced in the preamble of the "Technical Assessment Report: NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid"?

Thank you.

Brennain Lloyd
Sylvain,

I would appreciate receiving responses at your earliest convenience to the following questions, which have been generated in the course of our preparing comments on the Technical Assessment Report on HEUNL transport package design:

1. What is / will be the decision-making process for transport license and the export license which will be required should NAC-LWT revised package design be certified and an application for expert be received? In particular, what are the public comment opportunities?

2. Since 2003, what is the quantity of liquid HEU that has been produced at CRNL and what is its current status / storage condition, and intended long-term disposition? (REF: Section 1.2, para 2)

3. Is there any precedent for use of the NAC-LWT package for the transport of liquid radioactive wastes? (REF: Section 2.1, para 1)

4. Please provide us with a full inventory of the radionuclides in the solution, or provide us with a publicly available reference document that includes a full inventory of the radionuclides in the solution. (REF Section 2.3, Table 2)

5. Please provide us with a full inventory of CEPA-toxic constituents in the solution that are not included in the full inventory of radionuclides requested in Question #4. (REF Section 2.3, para 2)

6. Please confirm that CNSC staff assessed information with respect to normal and accident conditions as submitted by NAC International and did not conduct or observe any actual tests with respect to the NAC-LWT transport package as modified by the addition of inner containers to contain the liquid HEU (REF: Section 2.5, all paragraphs)

7. Can the CNSC provide a summary of NAC International experience in shipping liquid highly radioactive waste in a similar or larger volume than is being contemplated for the transport of the HEUNL from CRL to SRS?

Thank you for your continued assistance.

Brennain Lloyd
Date: February 9, 2015

To: Canadian Nuclear Safety Commission  
P.O. Box 1046, Station B  
280 Slater Street  
Ottawa, Ontario, Canada K1P 5S9

From: Northwatch

Re.: Northwatch Comments on the Technical Assessment Report on the NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid

Sent by email consultation@cnsc-ccsn.gc.ca

1. On December 23rd, 2014, the Canadian Nuclear Safety Commission (CNSC) gave notice that they had received an application for package design certification for the transport of highly enriched uranyl nitrate liquid (HEUNL) and were accepting comments on the technical assessment report is February 9, 2015.

2. We have reviewed the Technical Assessment Report on the NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid and several related documents, made available by the CNSC and by other sources.

3. In general, we found the Technical Assessment Report on the NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid prepared by the CNSC to be inadequate as documentation of a review of a proto-type container to be used in the transport of an extremely dangerous material in a series of unprecedented shipments. In several areas the document – and so, therefore, the assessment which the report documents – appears to rely on unsupported assumptions or generalizations. In other cases, the document states directly that information that is central to the review is not being made available to review participants, i.e. the commenting public. In some cases, the information is highly technical and it is unreasonable to require the review participants to evaluate the information without any technical support, which should have been made available through a participant funding program. In the following comments we will provide examples of some of the deficiencies identified, and made recommendations with respect to review process.
4. In the preamble to the Technical Assessment Report (TAR), the CNSC rationalizes that “Removing existing HEU material from Canada and reprocessing it for peaceful purposes promotes non-proliferation and security” but appear to have not done any risk assessment in which the purported benefits of consolidating the HEU are compared to the risks resulting from the proposed transport of the materials over long distances, and so increasing the availability of the materials to rogue players while in transit, as well as adding the risks associated with the transportation itself, even if security is never breached from a proliferation perspective. Our concerns in this regard have been elevated by our finding that the TAR provided no information about security measures to safeguard the shipments. While we recognize that such security measures would not appropriately be described in detail – for security reasons – the document should have, at minimum, including a general description, including identification of the responsible parties, the protocols for determining route suitability, the general approach to providing safeguards for the secure shipment of high-risk shipments, etc. None of this information was provided; the document failed to even appropriately acknowledge the need for such measures. While we do not intend to argue against the broader stated objectives of the Global Threat Reduction Initiative as they relate to non-proliferation and the urgent need to make secure any and all weapons-usable materials, we are unconvinced that the transport of the liquid highly enriched uranium from Chalk River to Savannah River will, in net, provide any reduction of risk. Rather than reduction of risk, it appears to be an exchange of risks: exchanging the hypothetical risk of the HEU material currently stored in Chalk River becoming available to rogue players for the combination of the increased risk of the HEU material becoming available to rogue players during transit and the introduced risk of accidents and radioactive releases during transportation.

5. We note that the application under review is for an amendment to the transport package. The transport package was designed and has been used for solid radioactive, and must be amended if it is to be used for the transport of liquid waste. The package is being amended by adding four inner containers. According to the CNSC "the design of the inner containers is proprietary and can therefore not be shown". The Technical Assessment Report and the Environmental Assessment Information Report issued by the CNCS for public comment do
not provide any information about the design or the materials or methods used to manufacture the added inner containers. The report provides no information about the basis for their assessment. Given that the addition of the inner containers is the amendment, the exclusion of the design of the inner containers from the application review is bizarre, to say the least.

6. In addition to the absurdity of conducting a review that excludes the subject of the review, the CNSC review—a review that at least based on its documentation provided—failed in a number of respects, including because it appears to have relied almost entirely on material provided by NAC International, including having accepted NAC’s risk analysis and dose estimates. We found no evidence in the TAR of Canadian authorities having conducted independent testing, and found only very generalized references to what testing the NAC-LWT package was subject to. Indeed, the word “stringent” was used, but no information supporting the selection of “stringent” as the applicable adjective was provided.

7. Included in the report is a one and a half page “criticality evaluation”. In this section, the CNSC reviewers confirmed that criticality is a safety concern—the highly enriched uranium is able to sustain a nuclear chain reaction—but concluded that even accident conditions do “not raise criticality concerns”. This section of the report exemplifies the need for a full review process with the opportunity for the public to retain independent experts to review the technical information. For Northwatch, as for most public interveners, some portions of this particular section is beyond our technical capability. However, the criticality concerns are one of the greatest areas of concern identified with respect to these shipments (as are container failure and security concerns). Without independent review, particularly given our concerns about the TAR more generally, we have no confidence in the CNSC staff conclusions with respect to criticality.

8. The review included a purported Environmental Assessment report in order to meet a commitment made at a public meeting of the Commission in May 2013. However, we found this document to be an Environmental Assessment in name alone. This purported
“environmental assessment” did not include the key elements of environmental assessments, namely an analysis of need, alternatives to the project, and alternative means of carrying out the project. For example it did not examine the need for the project, at least not outside the need to align – presumably with an eye on the optics - with a political announcement in early 2012. Nor did it examine alternatives to the project, or alternative means of meeting the needs of the project, or alternative means of carrying out the project. For example, there was no examination of options such as solidifying the contents of the FISST tank, potentially in combination with some downblending of the materials, and then storing long term on the Chalk River site (having reduced the proliferation risks) or of solidifying the wastes prior to shipment. Both documents are curiously silent on how more recent HEU wastes are being managed at the Chalk River site, and what the long term strategy is for more recent HEU wastes.

9. The Canadian Nuclear Safety Commission takes the position that during a “transportation emergency” it is the province or municipal government that is the “responsible authority” and will be the first responders. In effect, this makes the CNSC the “risk maker” and the all other levels of government the “risk takers”, as the front line workers and emergency responders will have no option but to take the risk associated with these shipments – including the radiological risk – should an accident occur. Based on the limited description provided, it appears that CNSC will be tucked away in the Emergency Operating Centre back in Ottawa taking calls from the media, and it will be the volunteer fire department and other first responders who will be out at the accident scene managing the situation in the real world. It must be noted that while the purported purpose of this entire operation is non-proliferation, it would be unreasonable to expect there to be any ability on the part of the municipal and provincial first responders to handle any non proliferation issues. Clearly, all emergency responders all along the proposed routes would need highly specialized training in advance of any shipments and likely additional advance provisioning with equipment. Presumably, most of the route is going to be outside the immediate reach of any nuclear facility, and so those emergency workers along the route would not have received any of the training that their counterparts might have in communities where nuclear generating stations have already
triggered specialized emergency training and emergency response planning. None of these risks and challenges are acknowledged in the TAR or EA.

10. According to the undated news release posted on or around December 23 2014, there are several additional decision points related to these proposed shipments, including:
   - an application must be made to the CNSC for a transport licence
   - Each shipment of HEUNL requires its own individual transport licence
   - any shipment of fissile material (such as HEUNL) requires an emergency response assistance plan that must be approved by Transport Canada
   - The CNSC also requires that an export licence be issued for these shipments.

These directly related decision points are identified, but no information is provided about the decision-making process, who the decision-maker is (i.e. Commission vs designated officer), or what the public participation opportunities will be.

11. During our review of the TAR and EA documents, we forwarded a number of questions to the Canadian Nuclear Safety Commission. In response, we were advised that “the CNSC will address all questions that were received during the consultation period. Once the period is over (ending February 9, 2015) and CNSC staff have completed their review of the comments, we will be posting a dispositioning table on our website. This table will show all the comments received and how the CNSC has dispositioned each of them. Please monitor our website periodically. Our purpose in forwarding the questions was to improve our understanding of the project as proposed, with the intention of incorporating our improved understanding into the preparation of our comments. Given this, we found the CNCS response that no replies would be provided until after the CNSC rather perplexing, but look forward to receiving responses to our questions, and will then potentially be able to incorporate our increased understanding of the project in future opportunities to engage with the CNSC in any subsequent related review. The questions are included in Appendix 1.
12. In conclusion, we request that the Canadian Nuclear Safety Commission:

- Refuse the NAC application
- Should any future applications be received related to this initiative, make the project subject to a full review, including a public hearing and participating funding awards to support review and engagement in future decision-making
APPENDIX I
NORTHWATCH QUESTIONS FROM JANUARY 20TH AND FEBRUARY 3RD

QUESTION # 1
Slides from a recent meeting at the Savannah River Site describe, on Slide 8, shipments from AECL. (posted at [http://www.srs.gov/general/outreach/srs-cab/library/meetings/2014/nm/lbasinupdate_mmaxted.pdf](http://www.srs.gov/general/outreach/srs-cab/library/meetings/2014/nm/lbasinupdate_mmaxted.pdf))
The points are as follows:

AECL has NRU/NRX fuel that is longer and heavier than typical Material Test Reactor Fuel Contract signed in 2012 where prepayment of $10 Million made for the modifications to be made for receipt of the fuel in L-basin Modifications to the Shielded Transfer System (STS) are required to remove the fuel from the LWT cask.
New unloading station developed to remove the fuel from the basket and load it into bundles for storage in L-basin.
Fabrication of the STS modifications are expected by end of Calendar Year 2014
Receipts expected to begin in March 2015. Multi-year shipping campaign
No other modifications are expected for typical MTR Fuels.
All non-typical MTR fuels will be evaluated on a case-by-case basis.

Can you please confirm - or correct - my impression that this slide is in reference to the same shipments as are being referenced in the preamble of the "Technical Assessment Report: NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid"?

QUESTION # 2
The "Technical Assessment Report: NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid" includes a statement that:
"The CNSC has not yet received an application to transport or export HEUNL to the U.S. Prior to the approval of any shipments of HEUNL in a certified package, the CNSC will ensure that all regulatory requirements are met. These requirements include the approval of a transport security plan by the CNSC for these shipments, that there is an Emergency Response Assistance Plan approved by Transport Canada in place, and that a CNSC export licence has been issued."

What will the review process be for the application to transport or export HEUNL to the U.S? In particular, will the public have the opportunity to review and comment on that transport/export application?

QUESTION # 3
The "Science and Innovation" page on the SRS web site (see [http://www.srs.gov/general/srnl/science_innovation/nuc_matls_recovery.htm](http://www.srs.gov/general/srnl/science_innovation/nuc_matls_recovery.htm)) States that the AECL/SRS partnership includes "Preparations to Receive 1000 Research Reactor Fuel Assemblies"

I was unable to find a similar statement in the Technical Assessment Report. Can you please verify this SRS number and translate that into # of shipments?
QUESTION #4
Since 2003, what is the quantity of liquid HEU that has been produced at CRNL and what is its current status / storage condition, and intended long-term disposition? (REF: Section 1.2, para 2)

QUESTION # 5
Is there any precedent for use of the NAC-LWT package for the transport of liquid radioactive wastes? (REF: Section 2.1, para 1)

QUESTION #6
Please provide us with a full inventory of the radionuclides in the solution, or provide us with a publicly available reference document that includes a full inventory of the radionuclides in the solution. (REF Section 2.3, Table 2)

QUESTION #7
Please provide us with a full inventory of CEPA-toxic constituents in the solution that are not included in the full inventory of radionuclides requested in Question #4. (REF Section 2.3, para 2)

QUESTION #8
Please confirm that CNSC staff assessed information with respect to normal and accident conditions as submitted by NAC International and did not conduct or observe any actual tests with respect to the NAC-LWT transport package as modified by the addition of inner containers to contain the liquid HEU (REF: Section 2.5, all paragraphs)

QUESTION #9
Can the CNSC provide a summary of NAC International experience in shipping liquid highly radioactive waste in a similar or larger volume than is being contemplated for the transport of the HEUNL from CRL to SRS?
There is no Environmental Impact Statement (required Under U.S. National Environmental Policy Act) available to the public on the packaging of HEUNL. Instead, the information on packaging for NEUNL is stated to be “proprietary”. There is no publicly disclosed plan for emergency response; evacuation of the public, immediate notification to the public of an accident should it occur; no provision of housing, food, competent medical care for radiation exposure; no long term provision for the needs of people who may lose their homes, jobs, assets and never be able to return to permanently radioactively contaminated regions. There is no attention to evacuation routes and destinations for evacuations along the HEUNL transportation route. In fact, a massive evacuation of the public immediately and in the direction away from a radioactive plume is not considered by Canadian or U.S. nuclear regulatory entities. The public is not allowed even the knowledge of the HEUNL transportation route that would afford the opportunity (if one were able) to get as far away as possible from the potential for a catastrophically accident. The public is implicitly expected to suck it up and die or become profoundly ill and suffer greatly and alone on their way to their deaths, should a major accident occur.

The transportation of HEUNL is unnecessary and not being done for the reasons stated. It could be solidified and stored on site and denatured, making weapons-grade uranium no longer weapons usable. An unnecessary risk is proposed in contempt of the public interest.

Vic and Gail Macks, concerned citizens
20318 Edmunton St.
St. Clair Shores, MI 48080
To The Canadian Nuclear Safety Commission,

I am very alarmed by the proposal to transport radioactive waste on public roads in North America. It is my understanding that 23,000 litres of highly radioactive liquid wastes containing an acidic and aqueous solution of fission products, transuranic actinides, and highly enriched uranium (HEU) -- a liquid that is referred to as HEUNL -- will be transported.

This is wrong and dangerous. In fact the whole nuclear industry is wrong and dangerous. The waste problem has never been resolved, and it does not appear that we will have a solution anytime soon.

The solution in my mind is to leave nuclear power to the sun, 93 million miles away.

sincerely,

Monika Schaefer
Re: HEW transport:

CNSC must assert an independent and questioning stand against the nuclear industry, if it wants to have any credibility as a regulator.

Further, as long as the HEW has any probability of being used in weapons, the moral reprehensibility of the whole project should, alone, shut it down.

As a psychiatrist, I demand that the HEW transport process be subject to the conditions and constraints of reality. Engineering and related reports are known frequently not to reflect the concerns of real people.

James Deutsch, MD, PhD, FRCPC

University of Toronto

227 Victoria St.

Toronto, M5B1T8
February 8, 2015

Canadian Nuclear Safety Commission  
P.O. Box 1046, Station B  
280 Slater Street  
Ottawa, Ontario, Canada K1P 5S9

RE: Public consultation on HEUNL transport package design

I have read the Technical Assessment Report for the NAC-LWT Package Design for Transport of HEUNL and am satisfied that it is based on proper engineering and safety considerations.

I am in favour or repatriating these nuclear waste products and do not agree with the objections I have read.

While I would have appreciated more information on which to base my understanding and evaluation of the inner container, I appreciate the need for confidentiality, both from a commercial and security point of view.

This package design seems an excellent compromise between cost, transportability and safety. The external package design alone has demonstrated itself to be a safe and reliable method of transporting HEU products and should serve well in this application.

That the shipment of highly radioactive liquid waste over public roads may be unprecedented in North America is not a valid or reasonable objection to the repatriation of HEUNL products.

Neither is the objection that the external package has never been used for liquid radioactive waste transport. Specifically the inner containers will be used to ship the liquid, the outer packaging is used to protect the inner containers and in this respect have demonstrated their fitness for purpose both through tests and empirically.

While some have expressed concerns that the HEUNL could be dispersed into the environment in the event of a 'serious' accident, the probability of dispersion seems highly unlikely given the engineering that has gone into the design of the shipping package.

Providing the shipping packages are manufactured in accordance with the design and quality control is strictly adhered to, including appropriate NDE testing, I see no danger to the public or the environment.
during the proposed repatriation of the HEUNL.

The fact that it might take a year to repatriate all the HEUNL does not in my opinion significantly increase the risk to the public and environment under normal conditions.

Some have objected to the transport of HEUNL on the basis that no environmental hearings or any other public forum were held to examine potential impacts of transporting this waste or to consider alternatives means to handle it. These arguments tend to be advanced by groups which are opposed to anything nuclear and whose goal is not so much developing safe standards and protocols as it is preventing the transport and use of nuclear technology and materials. Environmental assessments, hearings and fora were conducted when transport of solid nuclear wastes was first proposed. These same objections and concerns were first raised then and have empirically been demonstrated as being overblown. Furthermore this is merely an adaptation of an existing successful and safe transport package, not a completely new process. Lastly the repatriation is being conducted as a result of international agreements and efforts to promote non-proliferation.

The main concerns we have relate to potential terrorist or saboteur actions. While I am confident that the engineering of the transport package is more than adequate to protect the HEUNL containers from even serious transport accidents, no consideration appears to have been given to protection from actions designed to damage the transport containers through the use of weapons, explosives or other means.

Environmental activists, such as Greenpeace, have shown a criminal disregard for the damage they create during, or as part of, their protests. The FBI recently admitted that it was tracking ISIS terror cells in every State except Alaska.

While I appreciate that security dictates not divulging information which could help terrorist or saboteurs, it would be helpful in evaluating the suitability of the transport package to know that these circumstances had been considered during the review and approval of the transport package.

Regards

George Browne
Co-Chair Lake Superior Action Research Conservation
lsarc.ca
Dear Members of the Canadian Nuclear Safety Commission,

I am appalled that you are contemplating transporting high-level nuclear waste in liquid form over public roads in Canada.

Yours truly
Evelyn Gigantes

629 Mansfield Ave
Ottawa, K2A 2T3
613 722 3912
To whom it may concern,

This is to share my opinion that highly radioactive liquid waste should not proceed. In particular, I hear this has been proposed for shipments from Ontario to South Carolina. I would like to oppose this move on the grounds that I understand that:

- The shipment of highly radioactive liquid waste over public roads is unprecedented in North America. The casks to be used to ship the waste have never been used for liquid radioactive waste transport.
- These liquid radioactive wastes could be dispersed into the environment if a serious accident occurs. Cleaning it up would be very difficult, if not impossible. The resulting radioactive contamination could last for centuries.
- One or two-truck convoys, each carrying a single cask of about 256 litres of the FISST solution, and escorted by armed guards, would travel weekly from Chalk River Labs to the Savannah River Site during the summer months. The entire consignment -- about 40-50 shipments -- would take a year or more.
- There have been no environmental hearings or any other public forum to examine potential impacts of transporting this waste or to consider alternatives means to handle it, such as solidifying it and storing it on site, or denaturing the weapons-grade uranium so that it is no longer weapons usable.

Shipping highly radioactive waste in liquid form over public roads is unwarranted. It sets a dangerous precedent, as it could legitimize future shipments of liquid radioactive wastes on a global scale. The plan to ship this waste must be halted and a public decision-making process instituted to deliberate on this matter, for the safety and protection of the public, and for the sake of international security.

Many thanks for carefully considering all these issues.

--

Veronica Dahl
Visiting Professor, University of Ulm, Germany
Professor, Computing Sciences (Emeritus)
Associate Professor, Cognitive Sciences
Simon Fraser University
Burnaby, B.C. V5A 1S6
Canada
http://www.sfu.ca/people/veronica.html
Attention CNSC

Re: The transport of Highly Enriched Uranium in liquid form, from Chalk River, Ontario to Savannah River, South Carolina.

Shipping highly radioactive waste in liquid form over public roads is environmentally dangerous and unwarranted. It also sets a dangerous precedent, as it could legitimize future shipments of liquid radioactive wastes on a global scale. The plan to ship this waste must be halted and a public decision-making process instituted to deliberate on this matter, for the safety and protection of the public, and for the sake of international security.

Please ...Please ...stop all this insanity! Do not continue to turn a deaf ear to or belittle public voices and concerns!

Yours sincerely

Jim Penna
706 28th Street West
Saskatoon
S7L 0L4
To CNSC:

I absolutely oppose the transport of Highly Enriched Uranium in liquid form, from Chalk River, Ontario to Savannah River, South Carolina.

Radioactive liquids must never be transported over public roads. Just imagine the results if one of the trucks were to be involved in an accident on Highway 401 or any other busy highway. Not only would there be the usual traffic accident toll, but there would also be radiation exposure of thousands of people in the area.

In addition, there is the risk of terrorists taking advantage of the situation. The prospect is unthinkable.

No matter how foolproof your plan and how impregnable the containers, it is not worth the risk.

Do not do this. The risk is just too great.

Sincerely,

Kate Chung

235 St Clair Ave West, Apt 106
Toronto ON M4V1R4

--

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has."  
Margaret Mead
Dear Sir or Madam

I would like to object to the transport of this HEUNL from Chalk River to Savanah South Carolina over public roads. This is unprecedented. There are risks of terrorism that we hear about everyday in the news. There has not been an Environmental Assessment. Being liquid, if the containers leaked, it would be extremely difficult to clean up, particularly if going over the St. Lawrence Seaway, another body of water. This material could be converted into a solid and much more easily transported. I am further concerned that this HEU may end up in new nuclear weapons which are a further risk to all humanity due to accident, miscalculation and terrorism or actual war be it over the Ukraine, Middle East, India Pakistan or the Koreas. Please do not let this happen. I look forward to hearing from you at the above address rdenton@nosm.ca as to why this cannot be shipped more safely in a solid form.

Yours sincerely,

Richard Denton, BSc, MD, MC1Sc, CCFP, FCFP, FRRM
Associate Professor at Northern Ontario School of Medicine
Former Mayor of Kirkland Lake

--

Past President, Physicians for Global Survival

RR #1 Tarzwell, ON P0K 1V0

Because of our concern for global health, we are committed to the abolition of nuclear weapons, the prevention of war, the promotion of nonviolent means of conflict resolution and social justice in a sustainable world.

Please join PGS today – visit http://pgs.ca/?page_id=116 or call 613-233-1982 for more information
I think it is an appalling idea to truck radio-active liquids from Chalk River to South Carolina. Trucks can have accidents and trucks can leak. The thought of radio-active material all over a highway, or leaking over a long distance, if the truck should develop a leak.

Whatever happens, it might well be a catastrophe.

Sincerely, Wendy Ounpuu
As per the consultation process regarding the final decision for certification of NAC-LWT package design for the transport of highly enriched uranyl nitrate, I am adamantly opposed to any such transportation of said contaminants through my traditional territories and ancestral lands.

As an Anishnawbek citizen of Garden River First Nation, I am exercising my inherent right to sovereignty and opposing the transportation of HEUNL through my ancestral lands and traditional territory. Exercising effective sovereignty is my inherent right to ownership of ancestral lands and traditional territory as stipulated in the United Nations Declaration of Indigenous Rights. Secondly, it specifies the state responsibility to consult with indigenous people regarding issues deemed an environmental threat to these ancestral land and request protection of these said lands by the state. I am requesting the Canadian authorities not provide certification to transport these goods through the said traditional territory occupied by Anishinawbek people. Thirdly, recent Canadian case law concluded First Nations consultation must be accommodated prior to expediting developments as such, increasing the voice of First Nations to be heard and no longer ignored. Essentially, I am abiding by Canadian case law and international law, and request you honor and respect these laws. Such transportation of said goods poses an environmental threat to the life and well being of the occupants of these ancestral lands, and threatens the sustainability of my First Nation. I reiterate, I am protesting and denying the certification of the transportation of HEUN through our traditional territory and request the Canadian government deny the certification as a form of protection provided by said state.

If you require further info, pls do not hesitate to contact me.

MIIGWETCH!
Libby bobiwash-waikqukmic
The news that you are about to ship 23,000 litres of highly radioactive liquid waste from its Chalk River Laboratory facility approximately 2000 kilometres to the U.S. Department of Energy in South Carolina as early as the spring of 2015 is shocking indeed and puts both Canada and the U.S. in extreme danger. These areas are densely populated and if there is any kind of an accident the outcome would be catastrophic.

Please rethink this carefully and come up with another plan. I will read the information I have and try to put forth alternatives. Clearly this is not worth the risk that it would be putting millions of people in.

Regards,

J. Lennox
To WHOM IT MAY CONCERN:

Is it not clear that we should not be using uranium as it is such a dangerous substance and is harmful to both human life, to all life for that matter and contaminates the environment. Have we not learned our lessons from Fukushima and Chernobyl? How much is it going to cost to bury the waste from nuclear reactors? Can we afford this energy any longer? What a terrible legacy to give to the future that has to watch the waste from the past 60 years for over 10,000 years. This is not even describable in words that humans had the audacity to create such waste with such far reaching effects. Now we have to ship weapons grade uranium back to the USA. This is a terrorist attack waiting to happen. How much is this going to cost the Canadian taxpayers? Most Canadians do not understand the dangers of using nuclear energy and radio nuclides for medical diagnosis. This has to stop. Why are we risking this?

More information needs to gathered to make a safe decision on whether to transport this material or leave it where it is and to store it safely. What is the consequence of an accident or if this material falls into the wrong hands? How much is this going to cost to transport safely vs. leaving it on site? If the material is only transported in the summer how is this going to take a year or more? Will the shipments be spread over a number of years? What would happen if this material finds its way into the environment? These questions have to be answered before transportation takes place. And for goodness sake will the nuclear industry stop saying that nuclear energy is clean. This is such a deception and is not serving the Canadian people to continue with this deception when such expensive and dangerous activities continue because of the misinformation given to the public that this is safe. We never should have got this far but here we are. Do the right thing for future generations.

Thank you.

Darlene Buckingham
1180 South Wilberforce Road
Tory Hill, ON
K0L 2Y0
earthdance@teksavvy.com
We don't want our roads radioactive. This is very dangerous.
Thanks. The plan to ship this waste must be stopped. It sets a dangerous precedent.

Judi Poulson
1881 Knollwood Drive
Fairmont, MN 56031
phone 507 235 5288
Please don't risk our water, our air, our soil, and our people with the stupid idea of shipping radioactive material through our communities. We are assaulted by radioactivity on the West Coast, from the seafood, and through walking through the food isle at the Dollar Stores, and any where near Chaulk River. Stop risking our lives!
KA Smith
To the Canadian Nuclear Safety Comission,

I am more than a little concerned about the plan to transport highly enriched urany nitrate liquid (HEUNL) waste from Chalk River to the Savannah River site in Georgia, USA.

HEUNL in liquid form, if spilled, would likely pose an acute health and environmental risk. Transporting rad waste by truck on public roads also poses a potential health risk. Despite the fact that the trucks would be escorted by armed guards, there is also a potential security threat in transporting material that is weapons grade uranium. Given that there are other unknowns in this plan, such as the design and testing (has testing been done?) of the containers for the liquid waste, it seems like a risky plan, and a bad idea. Don't allow it.

I do not have an alternate suggestion on what should be done with the HEUNL waste. Designing an alternate disposal plan is the AECL's responsibility. But I am quite certain that trucking it thousands of miles on public roads, even if to "repatriate" the enriched uranium waste to its origin in the US, is a bad idea.

Evan Edinger
Moving 23,000 litres of highly radioactive liquid waste nearly 2000 kilometres from Chalk River to the Savannah River Site in the United States puts people and the environment at an unacceptable risk. The shipment of HEU would need to pass through Eastern Ontario, cross international waters, enter numerous indigenous territories and cut through communities in six U.S. states. The impacts of any release of radioactive materials would be catastrophic, especially if it resulted in the contamination of our waterways. The communities along the intended transportation route will be most at risk from radioactive contamination resulting from a potential accident or terrorist attack on the shipment. Their ability to opt out is compromised by the secrecy of the route and the timing of the shipments... At the very least, communities along the potential routes must be informed and their decision to opt out must be respected. Communities along the route have the right to know, and a right to say no.

Pegg Campbell
Nuclear waste burns a hole into tomorrow. Nuclear waste must be contained and managed in perpetuity at the site where it was produced. It has no real value outside of being used to make more nuclear warheads, refurbish tired old nuclear warheads, or just make dirty bombs with it. No corporation on the planet has succeeded in undoing nuclear waste nor creating permanent storage for it.
It will require permanent management for hundreds or maybe even thousands of Years into the future,
There really is no other choice that I can see.
Sincerely
Tim Seitz
Dear CCNR,

I am respectfully requesting that a Public hearing be scheduled in cities along the projected route of these deadly shipments.

The public has a right to speak about matters that endanger the health and well being of their communities and families.

The transport of this type of material across international borders and through communities is unconscionable.

Michele Anderson
Board of Directors,
Empire State Consumer Project
Sir/Madam:
I'd like to submit the attached comments on the proposed shipments of highly enriched liquid uranium to the States in a NAC-LWT cask.
Marvin Resnikoff
802/732-8008
These comments focus on the thermal conditions of the NAC-LWT cask in a hypothetical fire accident and the response of the pressure valves. Since the calculations of the thermal section of the Safety Analysis Report and the CNSC assessment as they pertain to pressure buildup within the cask have been redacted, it is impossible to review with certainty what Nuclear Assurance Corporation has done. However, older analyses of the NAC-LWT containing water show that a realistic 15 minute fire can cause the pressure valves to fail. We provide a checklist of calculation details for regulators to address.

**NAC-LWT Cask**

Before the present generation of transportation casks, nuclear fuel was transported to the Nuclear Fuel Services reprocessing plant in West Valley, NY by Nuclear Assurance Corporation (NAC) in transportation casks with water coolant. The presence of a water coolant bears striking resemblance to the proposed shipment of liquid highly enriched irradiated nuclear fuel (HEUNL) from the Chalk River facility. The difference is previous shipments contained irradiated nuclear fuel, which was much more radioactive and thermally hotter than HEUNL. In the case of a transportation accident involving a hydrocarbon fire, the pressure valves in the cask were expected to open, even if the fire duration was as short as 15 minutes, according to a DOE contractor, Pacific Northwest Laboratory. Copied below is a section of a review of this cask, showing the failure thresholds. As seen, the rupture disk is expected to fail in a 15 minute fire at 1010 °C and coolant is lost after 50 minutes. The cask seals are expected to fail in 30 minutes.

Several differences with the PNL fire accident and the fire accident considered by CNSC are the following: the heat source in the Chalk River shipment is less, the configuration of the cask is 4 containers within the cask cavity rather than nuclear fuel, and the fire accident considered by PNL is 1010 °C vs. the regulatory fire, 800 °C. A fire of 1010 °C is the temperature of burning diesel fuel and is therefore closer to a realistic fire; the regulatory fire of 800 °C is the temperature of a house fire. CNSC and NAC are not claiming that the HEUNL cask could survive a real fire, just that the cask meets inadequate regulatory standards.

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1 Dr. Resnikoff is a physicist that has reviewed nuclear transportation issues since 1975, for State governments and public interest groups in Canada and the United States. His address is RWMA, Box 105, Bellows Falls, VT 05101. His email address is radwaste@rwma.com. His phone number is (802)732-8008.


Review of Proposed HEUNL Shipment

With the information provided in the Assessment and in all publicly available documents at the Nuclear Regulatory Commission library, it is impossible to analyze the thermal conditions in a hypothetical fire. The exact shape of the four containers that fit in the NAC-LWT cavity, and how each container is sealed is proprietary. But we surmise water comprises much of the cavity volume, similar to previous shipments containing nuclear fuel. In this sense, the shipments are similar to previous shipments. We also surmise that each container would over pressurize in a hydrocarbon real world fire. This is a matter that the regulatory agencies should investigate in detail, and allow the public to review NAC’s calculations.

We also surmise that the four containers will fit tightly within the cask cavity so external heat in a fire would be conducted metal to metal to the interior liquids. The modeling of heat flow, including conduction, is also not available. The regulatory agencies should examine this modeling in detail and allow the public to review NAC’s calculations.

The federal agencies should never have granted proprietary status to the design and calculation details. There is no competing shipper. There is no vital security information here. This is simply a cover-up by NAC, with the complicity of federal agencies.

<table>
<thead>
<tr>
<th>Type of Failure</th>
<th>Minimum Duration of Fire(^{(a)}) to Cause Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Coolant from Rupture Disk</td>
<td>15 min.</td>
</tr>
<tr>
<td>Closure Seal</td>
<td>30 min.</td>
</tr>
<tr>
<td>Drain Valve Seal</td>
<td>30 min.</td>
</tr>
<tr>
<td>Vent Valve Seal</td>
<td>30 min.</td>
</tr>
</tbody>
</table>

\(^{(a)}\) All fires assumed to be 1010°C (1850°F).
An Assessment of the Risk of Transporting Spent Nuclear Fuel by Truck

November 1978

Prepared for the U.S. Department of Energy under Contract EY-76-C-06-1830

Pacific Northwest Laboratory
Operated for the U.S. Department of Energy by Battelle Memorial Institute
Both of these cooling time periods after discharge were analyzed in the study. It was further assumed that shipments made in the mid-1980's would be on primary roads by licensed shippers. Table 4.2 shows the shipping characteristics assumed for analysis including the estimated shipping distances and number of truck shipments. Details of the calculations of spent fuel shipping requirements are presented in Appendix H.

<table>
<thead>
<tr>
<th></th>
<th>Once Through Fuel Cycle</th>
<th>Spent Fuel Reprocessing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipment Origin/Destination</td>
<td>Reactor/Interim Storage</td>
<td>Reactor/Reprocessing Plant</td>
</tr>
<tr>
<td>Age of Fuel at Shipment (Time after Discharge from Reactor)</td>
<td>180 days and 4 years</td>
<td>180 days</td>
</tr>
<tr>
<td>Number of Shipments per Year by Truck</td>
<td>885</td>
<td>885</td>
</tr>
<tr>
<td>Average Shipment Distance (Km)</td>
<td>690 (430 mi.)</td>
<td>930 (580 mi.)</td>
</tr>
</tbody>
</table>

4.4 REFERENCE CASK DESCRIPTION

Shipments of spent fuel are assumed to be made in a reference truck cask designed to transport one PWR or two BWR fuel assemblies. The approximate loaded cask weight is 23 MT (50,000 lbs). The cask has an overall length of 544 cm (214 in.) and a diameter of 96 cm (38 in.). The cask cavity has a length of 452 cm (178 in.) and a diameter of 34 cm (13.5 in.). Interchangeable fuel baskets provide the cask with a capacity of one PWR or two BWR fuel assemblies.

The primary cask cavity consists of a nominal 0.8 cm (5/16 in.) stainless steel pressure shell surrounded by a lead gamma shield 16.8 cm (6-5/8 in.) thick and a stainless steel penetration barrier 3.2 cm (1-1/4 in.) thick. Neutron shielding is provided by a borated water-antifreeze solution contained in a 11.4 cm (4-1/2 in.) thick compartmentalized tank which surrounds the
cask. An expansion chamber for the shield tank accommodates temperature sheathed balsa wood at each end of the cask given protection from impact damage.

The container has a single lid, attached with high-strength bolts and sealed with teflon O-rings. The closure requires a lifting spider, special tools and O-ring pressure test equipment. Two valve-type drain closures are provided.

Heat rejection is by convection through the water coolant in the cavity to the inner wall, conduction to the neutron shield, convection to the outer wall, and convection plus radiation to the atmosphere. Maximum heat rejection capacity is 11.5 kW. Maximum design conditions for the inner cavity during normal transport [i.e., 55°C (130°F)] direct sunlight, still air, maximum fuel burnup, minimum fuel cooling period) are 174°C (345°F) and 10 atm (150 psig). The primary cavity is designed to withstand temperature and pressure conditions of 278°C (532°F) and 67 atm (984 psig) under the fire accident condition [1/2 hr at a temperature of 800°C (1475°F)].

A detailed description of the reference spent fuel shipping cask is given in Appendix A.
6.2 RESULTS OF THE THERMAL ANALYSIS

The thermal analysis was performed with a special purpose computer code designed to analyze radiation and conduction heat transfer in detail and include an estimate of the effects of convection. Thermal failures of both the cask and fuel cladding were considered for several fire and loss of coolant situations. Thermal failure of the cask due to fire was assumed to occur when a cask component fails and radioactive material can be released to the atmosphere. The various basic events that lead to failure are identified in Section 8 through development of fault trees. The thermal analysis was conservatively based on the maximum decay heat load PWR fuel that can be carried in the reference cask. The analysis provides the information to determine the duration of a fire to cause various types of thermal failure and the time to failure for loss of coolant from other accident forces.

The cavity coolant was assumed to be lost from the cask when the mean cavity temperature reached 290°C. This is based on the rupture disk set to relieve the pressure at 76 atmospheres for saturated conditions. It was determined that the cask rupture disk would fail from overpressurization in about 2.5 hours after the cask was exposed to a 1010°C fire for 15 minutes. As the fuel temperature increases due to self-heating after the coolant is lost, the pressure in the fuel pins increases. This results in a hoop stress in the fuel pin cladding. Fuel pin failure occurs when the hoop stress exceeds the creep rupture strength of the Zircaloy 4 tubing. Smith(2) estimated that some PWR cladding will fail above 565°C and all fuel elements would fail above 675°C.

Data from seal manufacturers indicates that the teflon O-ring closure seal could withstand temperatures of 280°C (540°F) for a period of 48 hours. The seal can also withstand somewhat higher temperatures for shorter periods of time. For purposes of this analysis, the closure seal was conservatively assumed to fail if the temperature exceeds 320°C for longer than one hour. Considering the cask geometry, it was conservatively assumed that the seal would be at about the same temperature as the inner wall. It was then determined from the curves in Appendix G that a fire greater than 30 minutes duration at 1010°C would result in temperatures sufficient to fail the closure seal.
The drain valves and vent valve have teflon seals. Data on teflon valve seals indicate that failure would occur if the temperature exceeds 280°C (540°F). The valves are well protected from thermal stresses and it is difficult to predict what temperature they would be at during accident conditions. It was conservatively assumed that a fire duration of 30 minutes would fail the valve seals. Table 6.3 presents failure thresholds for the fire accident. It was conservatively assumed that loss of cavity coolant would occur in less than 2.5 hours for any seal failure due to fire.

**TABLE 6.3. Thermal Failure Thresholds**

<table>
<thead>
<tr>
<th>Type of Failure</th>
<th>Minimum Duration of Fire(a) to Cause Failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of Coolant from Rupture Disk</td>
<td>15 min.</td>
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<tr>
<td>Vent Valve Seal</td>
<td>30 min.</td>
</tr>
</tbody>
</table>

(a) All fires assumed to be 1010°C (1850°F).

Table 6.4 presents the length of time to failure of the reference cask and fuel elements for several cases analyzed in Appendix G. For cases with the coolant intact at the beginning of a 1010°C fire, the coolant is lost in less than 50 minutes. Case 3, an initial loss of coolant implies that the cask seals have failed allowing the coolant to drain from the cavity. Accident Case 6 shows that a fire which lasts longer than 15 minutes at 1010°C will result in release of the coolant. The column in Table 6.4 for time to fuel cladding failure is the length of time following a loss of coolant at which the first and last fuel elements fail by creep rupture. If an extreme mechanical impact precedes the fire, then all cladding may be initially failed.

The information in Table 6.4 is used in the analysis to determine the length of time over which the release occurs for the various fire accident cases, impact followed by fire, and the loss of coolant case. In all cases...
except the impact case, the significant release occurs over a period of time from 0.5 to 1.5 hours. For the impact case, an instantaneous release is conservatively assumed to occur.

All fire situations considered in this study exceed the cask licensing requirements.

**TABLE 6.4. Time to Thermal Failure for Reference Spent Fuel Cask and Fuel**

<table>
<thead>
<tr>
<th>Accident Case</th>
<th>Time of Loss of Coolant (hr)</th>
<th>Time to Initial Failure (hr)</th>
<th>Time to Failure of All Cladding (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 1/2-Hour Fire(a) at 1010°C (1850°F)</td>
<td>(\approx 0.8)</td>
<td>2.2</td>
<td>3.4</td>
</tr>
<tr>
<td>2. 2-Hour Fire at 1010°C</td>
<td>(\approx 0.6)</td>
<td>1.9</td>
<td>2.4</td>
</tr>
<tr>
<td>3. No Fire with an Initial Loss of Cavity Coolant</td>
<td>(\approx 0)</td>
<td>2.1</td>
<td>3.5</td>
</tr>
<tr>
<td>4. 1/2-Hour Fire(a) at 1010°C with an Initial Loss of Cavity Coolant</td>
<td>(\approx 0)</td>
<td>2.0</td>
<td>3.1</td>
</tr>
<tr>
<td>5. 2-Hour Fire at(a) 1010°C with an Initial Loss of Cavity Coolant</td>
<td>(\approx 0)</td>
<td>1.8</td>
<td>2.3</td>
</tr>
<tr>
<td>6. Minimum Duration Fire to Cause Loss of Cavity Coolant</td>
<td>(\geq 2.5) Hours for a 15-Minute 1010°C Fire</td>
<td>4.5</td>
<td>6.0</td>
</tr>
</tbody>
</table>

(a) Time zero at start of fire.
(b) Time zero when loss of coolant occurs.
To: The Canadian Nuclear Safety Commission (CNSC)

From: Gordon Edwards, Ph.D., President, [ccnr@web.ca]
The Canadian Coalition for Nuclear Responsibility (CCNR)

Re: CNSC Technical Assessment Report:
“NAC-LWT Package Design for Transport
of Highly Enriched Uranyl Nitrate Liquid”

Date: February 8 2015

1. The Canadian Coalition for Nuclear Responsibility (CCNR) applauds the Canadian Nuclear Safety Commission (CNSC) for inviting public comments on the Technical Assessment Report (henceforth called the Report) dealing with some technical aspects of the package being proposed for the transportation of 23,000 litres of highly radioactive liquid wastes containing an acidic and aqueous solution of fission products, transuranic actinides, and highly enriched uranium (HEU) -- a liquid that is referred to as HEUNL.

2. However CCNR deeply regrets the CNSC’s failure to schedule public hearings into the unprecedented transport operation itself, given the fact that post-reprocessing liquid wastes have never hitherto been transported over public roads in North America.

CCNR understands that the transportation route and the timing of the shipments are kept secret for security reasons, given the fact that the uranium in question is enriched to more than 90 percent of the explosive U-235 isotope, making it excellent weapons-grade material similar to that used as a nuclear explosive in the Hiroshima bomb.

But the need for security regarding the timing and routing of the shipments does not absolve CNSC from its responsibility to the Canadian public to conduct a credible, open and transparent assessment of the potential risks to human health and to the environment, particularly if there is loss of containment during transportation. In the post-Fukushima era, we must plan for unanticipated events, even if the planners do not regard such events as credible. Such a risk assessment goes far beyond the technical specifications of the packaging; it cries out for public hearings on the entire project.
3. Were the CNSC to fulfill its statutory obligations to be a champion of the public interest, by holding public hearings on the transport of these highly radioactive liquid wastes over public roads, then alternatives to the existing proposal could be systematically examined – alternatives that would still achieve the main objective – to remove weapons-grade uranium from the Chalk River site.

One such alternative would be to solidify the waste before shipping it. This would not be an impossible or even an onerous task, since the solidification of the very same kind of highly radioactive liquid waste containing weapons-grade uranium has been going on at Chalk River for the last 10 years or more, in a process called “cementation”

Indeed, prior to the proposal for shipping the liquid waste to the Savannah River Site, Chalk River Laboratories had already committed itself (during its most recent round of relicensing activities) to solidify the contents of the FISST (Fissile Solutions Storage Tank). This is the same material that is proposed to be sent to SRS in liquid form. Why not in solid form instead?

Another alternative would be to downblend the HEUNL liquid so as to dilute the HEU to LEU (low enriched uranium) that is no longer weapons-usable and therefore does not pose a security risk. Canada has already played a significant role in accepting such down-blended HEU from the Russian nuclear weapons program over the last decade. Down-blending eliminates the security risk from a weapons proliferation standpoint.

4. The Report makes it clear that the external package referred to as NAC-LWT has been used in the past only to transport solid irradiated nuclear fuel, never liquid high-level nuclear waste such as post-reprocessing liquid material. On page 5 of the Report we read "The NAC-LWT package is a lead-shielded shipping package designed to transport various types of used nuclear fuel. This package is to be modified by adding inner containers to hold the HEUNL to the existing package." Yet the design details for these inner containers are not described due to proprietary considerations.

Thus the public is being asked to comment on a package designed to carry solid waste, now being modified to transport liquid wastes, without any access to the technical details of that part of the package that will hold the liquid waste. This could well serve as an episode in a latter-day version of “Alice in Wonderland”, where logic is stood on its head.
To a casual observer, it would appear that this opportunity for public comment is intended only for public relations purposes, so that CNSC can maintain that it is truly concerned about public input when in fact that input is so limited as to be virtually meaningless in terms of the overall project. The public is asked to comment on a Technical Assessment Report that is lacking in essential technical details.

5. At any rate, it appears that the various regulatory requirements (as outlined on page 9 of the Report) for the NAC-LWT – the external part of the package – were verified without the inner liquid containers being included as part of the test.

CCNR is of the opinion that dropping the NAC-LWT without any liquid contents from a height of 9 metres onto an unyielding surface, or dropping it 1 metre onto a punch bar, or exposing it to an 800 degree C fire for 30 minutes, seems to provide no scientific justification for approving the modified package for transporting the liquid HEUNL.

The CNSC should insist that all these tests be repeated with realistic liquid contents.

6. In terms of risk assessment, CCNR feels it is misleading to describe the liquid contents of these shipments simply as Highly Enriched Uranyl Nitrate Liquid (HEUNL). As stated on page 8 of the Report, “HEU comprises less than 1 percent of the total weight percent of the solution”.

Indeed, the health and environmental risks are mainly associated with the non-uranium components of the liquid solution. According to Table 2 (page 9) in the Report, the radioactivity of the selected gamma-emitting isotopes and their daughter products is $3.4 \times 10^{11}$ becquerels per litre, which is over half a million times more than the radioactivity of U-235 per litre, and more than 11,000 times more radioactive than all the uranium isotopes combined.

It is perplexing that the Report does not quantify the total radioactivity (in becquerels per litre) of the highly radioactive solution. It only lists a handful of gamma-emitting isotopes and their daughter products, as well as a few alpha-emitting transuranic actinides. The Report fails to include any of the dangerous beta-emitters that are not also gamma-emitters, such as strontium-90, technetium-99, carbon-14, and hydrogen-3 (tritium).
And nowhere in the Report is there any discussion of what emergency cleanup measures would be undertaken in order to identify and retrieve, as quickly as possible, as much as possible of this liquid radioactive contamination in the event of a significant spill, however unexpected that may be.

Since the transport trucks will be travelling over 2000 kilometres, passing through many small communities, crossing many bodies of water, intersecting many agricultural zones, including vineyards and orchards, the public is entitled to know just how fast and how effective the emergency response is likely to be. Liquid wastes, after all, are much more mobile in the environment than solid wastes -- for which this package was first designed.

7. The TEPCO Corporation chose to underestimate the height of a tsunami wave that might strike the Fukushima Dai-ichi plant, despite prior knowledge of the possibilities.

We are told that the outer transport cask (NAC-LWT) is designed to withstand a drop of 9 metres (30 feet) onto an unyielding surface. Since these shipments will be travelling about 2000 km or more on public roads, crossing the border from Canada into the USA, they could be crossing over bridges that are, in places, higher than 9 metres above ground level. Under extreme conditions, the package could drop more than 9 metres off such a bridge onto pilings or rocks below.

Is the public to understand that the transports will not be allowed to cross any bridges where a potential drop of more than 9 metres would be possible? Unless such a prohibition is to be imposed and rigorously enforced, then CCNR recommends that the package be required to withstand a much larger drop -- one that would match or exceed the largest conceivable drop on any of bridges or any other sections of the alternate routes under consideration.

8. The intensity and duration of some of the transport-related fires that are possible, as the Lac Megantic disaster has shown, far exceed the requirements that the package withstand a fire of 800 degrees C for a period of 30 minutes. Given the inherent mobility of the liquid contents, CCNR feels that the fire-resistant standards for the proposed package are simply too lax, and are not fully cognizant of the disastrous experiences of recent years.
9. The claim that only 0.033 percent of the liquid contents would escape following an accident of maximum severity the CCNR finds to be a ridiculous assertion. The nature of a liquid is that once a leakage pathway has been established, unless there is some kind of "self-sealing" of that pathway, just about ALL of the liquid will eventually escape depending on how long a time has elapsed.

Given the lessons of Fukushima, that the unthinkable must be considered in accident planning, it is incumbent on the CNSC to consider what emergency action and retrieval efforts would be undertaken to recuperate the entire liquid contents of any one shipment in the event of 1%, 20%, 50%, or even 100% escape of the liquid contents into the environment.

It is disappointing to discover that the Report relegates all details of the calculation leading to the 0.033 percent figure to an appendix – called Appendix A – which is however not included in the version of the Report made available to the public. This is just one more feature of the process that makes it seem a sterile undertaking. At any rate, calculation is no substitute for actual testing, and CCNR asserts that physical testing of this hypothesis should be carried out.

For example, CNSC staff calculated external radiation doses following a leakage of 0.033 percent of the contents given on page 8 of the Report, in two separate categories. These external (gamma) doses would be increased by a factor of 30 if there was a 1 percent leakage, or by a factor of 300 if there were a 10% leakage. That would increase the calculated external exposures in the first category to 24.6 mSv or 246 mSv respectively. Quite a difference. And of course these calculations omit any internal doses caused by inhalation or ingestion of radioactive vapours or droplets. With 100% leakage, the calculated external dose in the first category would be promptly fatal.

10. The CCNR requests that CNSC fulfill its mandate to protect the public through an open, transparent process, by requiring a full public hearing into the entire HEUNL transportation proposal with adequate documentation on the technical details provided to enable the public to assess the safety claims made by CNSC staff and by the proponents.

In our view, given the fact that irradiated nuclear fuel in solid or liquid form ranks among the deadliest materials on Earth, it is unconscionable that the approval of this project be relegated to a designated officer without the full involvement of the Commissioners, and without benefit of a public hearing.
My message timed out on my computer and would not send before midnight, nor after. I am attempting to send again at 01:06 a.m. - Kay Cumbow

To: The Canadian Nuclear Safety Commission (CNSC),

From: Kay Cumbow

Re: CNSC Technical Assessment Report:

“NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid

Date: February 9 2015,

Thank you for inviting public comment on this report. I believe that most of the public in the U.S. is completely unaware of this report or of these proposed shipments: including emergency workers, such as police and fire fighters, first responders, also including many government officials and legislators. When a decision that will set precedence about transporting some of the most deadly and long-lived substances known to our societies is being considered, the public should not have to be the ones to inform the greater society.

According to the Canadian Coalition for Nuclear Responsibility, these shipments consist of “…23,000 litres of highly radioactive liquid wastes containing an acidic and aqueous solution of fission products, transuranic actinides, and highly enriched uranium (HEU) -- a liquid that is referred to as HEUNL.”

The reason that such highly radioactive liquids have never been (knowingly) shipped on public roads is partly due to a very real proliferation risk, but also due to the fact that if there was a breach of containment with a leak, or emissions from a fire, that clean-up would prove difficult, expensive, dangerous to workers, and maybe impossible. If this happened on a busy freeway, or during a rainstorm with heavy winds, it could prove very dangerous.

Have collisions with tanker trucks hauling gasoline or other flammable materials been considered? What about a collision with an airplane? Either could result in an explosion and/or a fire - and the casks to my knowledge, have not been tested in the field, with a fiery explosion. Although a collision with an airplane might be rare, many large cities do have major airports with often hundreds of flights taking off and landing daily. If a cask were to sink in one of the Great Lakes, and hit part of a bridge going down, what assurance is there that the canister would not be breached, and loss of some of the contents could occur? How could the contents be recaptured in such an event? How close could workers even get with a spill to the roadway, without getting strong doses? If a serious accident or long-burning fire occurred, I question the possible long-term contamination of communities, farmlands, watersheds on the route, or in a plumes’ path. How exactly would you warn a community in such an accident? How could farmland or a wooded area or a lake be cleaned up? Who would have liability?

Although the shipment is not due to travel in winter, we are now experiencing more heavy rain events during the rest of the year, with stronger and more sustained winds, stronger straight-line winds, more tornados, more flooding, more fog events. Our roads and infrastructure are failing in many areas, due to not being maintained properly. All of these can contribute to hazardous travel.

I have concern too that although these shipments would be considered high level radioactive waste
in the United States, they are not considered such in Canada. HEUNL does not convey the very real
danger that exists with these very toxic and fissile materials.

Since the shipments also pose a proliferation risk, I have concerns that they would make our
communities and highways on the route a terrorist target.

There are too many questions left unanswered and because these shipments would set a very
dangerous precedent in both the U.S. and Canada, I call on the Canadian Nuclear Safety Commission
to hold a full environmental review with public hearings. I urge you to look at the far safer
alternatives that exist, rather than shipping these dangerous liquid radioactive wastes on our
highways, and through our communities. Please don’t further risk the health of our communities,
our watersheds, our Great Lakes.

Kay Cumbow

15184 Dudley Rd.

Brown City, MI 48416
I am highly outraged by your plan to ship highly radioactive liquid waste. I take this as an indication of your decision to ignore public safety and to embrace nuclear industry profits.

Roger Johnson, PhD
Professor Emeritus
San Clemente, CA

*R. Johnson*
February 9th, 2015

Sent to consultation@cnsc-ccsn.gc.ca

Canadian Nuclear Safety Commission

Re: Comments on Technical Assessment Report-HEUNL Shipments

CNSC Tribunal Members:

Having grown up in Niagara On The Lake, I am compelled to raise my concerns with Atomic Energy Canada Limited’s plans to truck 23,000 litres of highly radioactive waste in liquid form from its Chalk River Laboratory facility thousands of kilometres to South Carolina, on a route likely passing through specialty agricultural areas of the Greater Golden Horseshoe Greenbelt. Transporting radioactive material in liquid form through wine country is putting the entire economy, the growing lands and water supply at undue risk. The economy of the Niagara Peninsula is dependent on tourism, wine making and tender fruit.

One radioactive incident in Wine Country, large or small, and the long nurtured reputation of the Niagara Peninsula will vanish along with its economic engine.

I request for this reason that you not transport liquid radioactive material on roads that pass within several km of specialized agricultural lands......

I request that you direct AECL to

1) devise a plan to deal with the waste on site in Chalk River

2) not transport on roads through the most densely populated area of Canada,

3) not transport through the specialty crop areas, especially the Niagara Peninsula

Sincerely,

Barbara Pulst

909 Vistula Drive, Pickering, L1W 2L6, ON

bspulst@sympatico.ca
Re: Highly Enriched Uranium shipments Chalk River, Ontario to Savannah River, South Carolina

To Whom It May Concern:

I am writing to you in response to the decision to ship 23,000 litres of high-level liquid waste from Chalk River, Ontario to Savannah River, South Carolina. According to the Canadian Nuclear Safety Commission (CNSC) Technical Assessment Report: NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid (TAR), each shipment, which is to be repeated weekly for a period of over a year, will contain a maximum of approximately 323.4 L of HEUNL per NAC-LWT package. Other materials include Plutonium, Tritium, Cesium, Strontium, and Iodine. This is an extremely radioactive acidic solution, which could potentially achieve a self-sustaining chain reaction of fissioning atoms (“criticality”), rupturing the transporting tank, and releasing the waste into the environment. Given that about 25-45 kgs of HEU (alone) is “considered sufficient to construct a small nuclear weapon or a Hiroshima-sized bomb” (National Post, Bomb-grade uranium to be shipped secretly from Chalk River, Ontario nuclear plant to US, February 11, 2013), the amount of damage that such a release would result in is unimaginable. Therefore one would assume that the decision for shipping would be made only after exhausting all possible testing methods to ensure that this is the best course of action for promoting non-proliferation and security in Canada and the United States.

However, and although the CNSC claims to “strongly value transparency and public consultation” (TAR), I am concerned that such a major decision is being taken without proper feedback from the communities affected, as a variety of essential information is being deliberately withheld. Specifically, this comment period refers to the technical assessment of the HEU package design, which consists of the previously certified NAC-LWT transport package by placing the HEUNL inside four inner containers that will be inserted into the package cavity. Contrasting its own claims, the TAR states that “the design of the inner containers is proprietary and can therefore not be shown in this report”. As citizens of
democratic nations, are we truly expected to accept that the financial benefits of a constructing corporation (in this case NAC International Inc-NAC) are more important than the safety and wellbeing of millions of people for thousands of years to come? Moreover, the report admits that “no prescribed information is included”, and that the assessment “is based on information submitted by NAC”, with the use of the bounding (statistical) method. This is absurd. The statement that “NAC has demonstrated in their application” the safety of their product is impossible to ignore, especially given the frequency of its appearance. Where is the “stringent” testing that the CNSC vows to assure? Where is the third party evaluation, which cannot be completed as the design modification details that we are supposed to comment on are not being publicized?

Similarly, according to the Environmental Assessment Information Report: Transport of Highly Enriched Uranyl Nitrate Liquid (EA), “for the protection of the public, information on specific shipment details is considered prescribed, which means the information is limited to individuals and authorities who have a legitimate need to know, such as police and fire departments”. Does this mean that, in your opinion, the need for information and transparency of the residents across the 2,200 km line that the shipments are to pass through is not legitimate? The over 90 Canadian and American groups endorsing the Resolution Against the Transport of Liquid Radioactive Waste can verify that this is not the case.

The CNSC staff seems so satisfied with the NAC application, that they have indeed concluded that the most reactive HEUNL configuration under normal and accident conditions of transport evaluated does not raise any criticality concerns, complies with the regulations, and has a transport criticality safety index of zero. Again, the decision was based on a review of the criticality safety analysis produced by NAC, which also claims that the addition of the HEUNL contents has not changed the quality assurance evaluation for the package.

Maybe if we knew more about the containers where the liquid waste is to be held, other than them being made out of stainless steel, it would be easier to trust NAC’s evaluations. Unfortunately, the information that we have been given regarding the testing raises major concerns. Specifically in the free-drop scenario for accident conditions of transport, the impact force is calculated based on a test conducted in the 1970's for the US Department of Energy. In my understanding, no further testing has been performed. When it comes to the puncture test, CNSC staff admits that they “previously assessed this test requirement for the package containing other contents, such as highly enriched uranium in solid form and confirmed that this test has no impact on the design of this package and the package remains leak tight”. Again, given the extremely toxic nature of liquid radioactive waste, shouldn’t we pursue a more reality-based testing scenario, before reality itself proves us wrong?

I have to admit that I fully disagree with NAC and SNCS’s position. For me, assuming that package modifications and content changes have no impact on the package’s efficacy is faulty thinking, regardless of whether it is puncture testing, or water immersion testing, which is also the case with HEUNL. According to the TAR, “NAC has demonstrated that the package will withstand an external pressure of 2 MPa for at least an hour, corresponding to a depth of water fo 200m. This means that a transport truck contacting the fissile material will safely remain under water for one hour, should an accident occur, with the truck falling, for example, off the Burlington Skyway into Lake Ontario. What
exactly happens after one hour? Is the truck going to be recovered within that timeframe? It seems to me that the CNSC believes so, as it believes that the area would be fully evacuated within 30’ from the accident, as it is assumed in the EA. It might also be helpful to note that the CNSC’s Transportation Support Plan is currently under development, and that for off site transportation emergencies, the provincial, territorial, or municipal government is the appropriate responsible authority for off site actions. The CNSC staff responsibility is to ensure emergency response planning is harmonized with the appropriate authorities.

This and other matters are to be solved before the shipment begins.

Thank you in advance,

Corina Psarrou-Rae

Welland, Ontario
Please do not permit shipment of Canadian liquid radioactive wastes across the U.S. to Savannah River. It is far too dangerous and the consequences of an accident would be devastating.

Marilyn Field
1101 1st Street, Apt. 208
Coronado, CA 92118
To: The Canadian Nuclear Safety Commission (CNSC) [submitted via: consultation@cnsc-ccsn.gc.ca]

From: Kevin Kamps, Radioactive Waste Specialist, Beyond Nuclear; Board Member, Don’t Waste Michigan, representing the Kalamazoo chapter


Date: February 9, 2015

Dear Members of the CNSC,

Please conduct a top level, comprehensive environmental review before rushing approval of this shipping scheme. Solid irradiated nuclear fuel and high-level radioactive waste is dangerous enough to transport; liquid high-level radioactive waste is even more dangerous to transport.

In addition, the involvement of both the Canadian and U.S. federal governments in this shipping proposal, increases the risks that the shipments will be targeted for terrorist attack. (Dr. James David Ballard, cited below, testified along similar lines as an expert witness, in the environmental coalition U.S. federal court action in Kalamazoo, Michigan in 1999 and 2000, regarding a weapons-grade plutonium shipment from Los Alamos Nuclear Lab in New Mexico, to Chalk River, Ontario.) So too does the fact that the shipments would contain highly-enriched uranium, which if separated from the mixture, is weapons-usable.

As part of a comprehensive environmental assessment, I urge CNSC to carefully consider the following reports and studies conducted by the State of Nevada Agency for Nuclear Projects (a part of the State of Nevada Governor’s Office). Granted, Nevada was focused on solid irradiated nuclear fuel and high-level radioactive waste shipments targeted at Yucca Mountain, Nevada. But the insights revealed, and light shone, by Nevada’s cutting edge work
over the past years and decades, is all the more appropriate, considering the even more risky nature of the proposed shipments: liquid high-level radioactive waste, containing weapons-grade HEU.

After all, shipment of liquid HLRW is unprecedented in North American history – for good reason. It is too dangerous. It is also unnecessary. The HEU could be down-blended to LEU (low-enriched uranium) on-site, safeguarding against nuclear weapons proliferation risks.

Just as well, the liquid HLRW could be solidified on-site at Chalk River, through the “cementation” process that has been carried out there for a decade or more already.

The entire State of Nevada, Agency for Nuclear Project's, Nuclear Waste Transportation website sub-section,

http://www.state.nv.us/nucwaste/trans.htm

is worthy of CNSC’s careful review.

Nevada has been doing cutting edge work on the risks of road (truck), rail (train), and waterway (barge) shipments of high-level radioactive waste, for decades, as part of its oversight of the proposed Yucca Mountain deep geologic repository targeted at it, against its will.

There have been some 2,500 to 3,000 shipments of solid high-level radioactive waste in US history. But most of those shipments took place many decades ago. In recent years, the rate of such shipments has slowed to a very small trickle. In many individual years, there are ZERO shipments of solid high-level radioactive waste traveling in the U.S.

Below, I’ve cited numerous sub-links listed at the site above, specific to high-level radioactive waste transport risks (although the entire site is about that). I urge the CNSC to consider all of Nevada’s studies carefully. I also urge CNSC to conduct comprehensive environmental assessment hearings, with full public comment opportunities, given the severe risks shipping liquid high-level radioactive waste would represent.

Thank you for your consideration of my comments.

Sincerely,

Kevin Kamps, Radioactive Waste Specialist, Beyond Nuclear
and Board Member, Don’t Waste Michigan, representing the Kalamazoo chapter

Beyond Nuclear
State of Nevada, Agency for Nuclear Projects, Nuclear Waste Transportation Risks studies and reports, for CNSC’s careful consideration (in reverse chronological order):

Friday, November 21, 2008

- **State of Nevada** - *Potential Consequences of a Successful Sabotage Attack on a Spent Fuel Shipping Container* - Radioactive Waste Management Associates (pdf-2.69M)
  
  http://www.state.nv.us/nucwaste/news2008/pdf/rwma0810sabotage.pdf

Thursday, March 06, 2008

  

Monday, January 07, 2008


http://www.state.nv.us/nucwaste/news2008/pdf/WM05_terrorism.pdf
Wednesday, January 31, 2007


[Please note: this particular report does not address high-level radioactive waste, or irradiated nuclear fuel, *per se*, but rather so-called "low" level radioactive waste -- TRU (transuranic contaminated military wastes, including plutonium) -- but it does provide insights into risks, even for rural areas, such as Native American reservations, from such radioactive waste shipments. And besides, TRU, despite being arbitrarily labeled “low” level radioactive waste, carries significant radiological hazard.]

Tuesday, January 03, 2006


  http://www.state.nv.us/nucwaste/news2005/pdf/nv051230nrc.pdf

[This letter refers to a real world train tunnel fire, under downtown Baltimore, Maryland, USA, in July 2001. This real world accident revealed -- according to a Nevada-commissioned study (see below) -- that high-level radioactive waste shipping containers would likely have failed, and released disastrous amounts of hazardous radioactivity, had they been on that train. And that train tunnel had, in fact, been targeted by US Department of Energy for Yucca Mountain, Nevada-bound rail shipments of irradiated nuclear fuel, as from Calvert Cliffs nuclear power plant in Maryland.]

Friday, May 20, 2005


  http://www.state.nv.us/nucwaste/news2005/wm/native_american.pdf

Tuesday, March 18, 2003


[Please note: even liquid high-level radioactive waste shipments not involved in an accident or attack, can still have radiological impacts on people -- due to the gamma and neutron radiation coming off of/being emitted by them. As Lauren Olson has put it, shipments of high-level radioactive waste are like "Mobile X-ray machines that can't be turned off."

In addition to the gamma and neutron radiation being emitted through the radiation shielding of the transport container, there is also the risk that shipping containers can become externally contaminated, delivering even higher radiation doses to persons at close range. In France, for example, in the mid- to late-1990s, it was revealed by activists and investigative journalists that 1/4 to 1/3 of ALL shipments going into the La Hague reprocessing facility were externally contaminated; many times, the contaminated shipments emitted 500X the “permissible” radiation dose; one emitted 3,000X the “permissible” dose. “Permissible” does not mean safe; it merely refers to the regulatory limit.]

Tuesday, March 04, 2003

- **State of Nevada and Clark County -- Waste Management 2003**
  - *Implications of the Baltimore Rail Tunnel Fire for Full-Scale Testing of Shipping Casks* - Robert J. Halstead, Fred Dilger (pdf-52K)


    http://www.state.nv.us/nucwaste/news2003/pdf/nv030225b.pdf


    http://www.state.nv.us/nucwaste/news2003/pdf/nv030225c.pdf
[As mentioned above, these studies shine more light on the lessons to be learned from the Baltimore train tunnel fire of July 2001. Also, the “How Many Did You Say?” report provides perspective on the 2,500 to 3,000 shipments that have occurred in the U.S. from the 1960s till recent years, compared to what would come under such a program as the Yucca dump -- many thousands (if mostly by rail) to tens of thousands (if done by legal weight truck) shipments, over decades. The relevance to the liquid high-level radioactive waste shipments proposed here is that they are unprecedented. That is, no such shipments have ever occurred, neither in the U.S. nor Canada. Thus, they represent uncharted territory. Any claims of thousands of safe shipments in the past – already false, as shown below – are not apt, for no such shipments of liquid high-level radioactive waste have ever taken place, so comparisons to previous shipments of solid high-level radioactive waste are not appropriate.]

Wednesday, February 13, 2002

- **RWMA** - [Worst Case Credible Nuclear Transportation Accidents: Analysis for Urban and Rural Nevada](http://www.state.nv.us/nucwaste/trans/rwma0108.pdf) - Matthew Lamb, Marvin Resnikoff, Ph.D. and Richard Moore, P.E.


- **State of Nevada** - [Radiological Consequences Of Severe Rail Accidents Involving Spent Nuclear Fuel Shipments To Yucca Mountain: Hypothetical Baltimore Rail Tunnel Fire Involving SNF](http://www.state.nv.us/nucwaste/news2001/nn11459.pdf)

Tuesday, November 06, 2001


Thursday, July 12, 2001

- **State of Nevada** - [Risky Transit -- The Federal Government’s Risky and Unnecessary Plan to Ship Spent Nuclear Fuel and Highly Radioactive Waste on The Nation’s Highways and Rail Roads](http://www.state.nv.us/nucwaste/news2001/nn11459.pdf)

Tuesday, May 01, 2001

http://www.state.nv.us/nucwaste/news2001/nn11180.pdf

January 31, 2000

State of Nevada - Additional State of Nevada Comments to the NRC on Nevada’s Petition for Rulemaking with Respect to Safeguards for Spent Fuel and HLW Shipments

http://www.state.nv.us/nucwaste/news2000/nn10472.htm

December 8, 1999

State of Nevada - Comments of Robert J. Halstead on Behalf of The State Of Nevada Agency For Nuclear Projects Regarding The U.S. Nuclear Regulatory Commission Study Assessing Risks of Spent Nuclear Fuel Transportation Accidents (Modal Study Update)

http://www.state.nv.us/nucwaste/news/nwpo991208a.htm

June 24, 1999

State of Nevada - Governor and Attorney General Seek Tougher Protections Against Nuclear Waste Terrorism

http://www.state.nv.us/nucwaste/news/nwpo990624.htm

June 22, 1999

State of Nevada - Letter to Dr. Shirley Ann Jackson Re: Nevada’s Petition To Institute Rulemaking To Amend Regulations Governing Safeguards for Shipments of Spent Nuclear Fuel (SNF) Against Sabotage and Terrorism and To Initiate A Comprehensive Assessment

http://www.state.nv.us/nucwaste/news/ag990622a.htm
June 22, 1999

**State of Nevada -** Petition To Institute Rulemaking And To Initiate A Comprehensive Assessment

http://www.state.nv.us/nucwaste/news/ag990622b.htm

May 20, 1999

**State of Nevada -** Fact Sheet: Transportation of Spent Nuclear Fuel and High-Level Radioactive Waste to a Repository

http://www.state.nv.us/nucwaste/trans/trfact03.htm

And see the long list of pre-2000 reports and fact sheets at the bottom of the web site section on Nuclear Waste Transport risks. There are many posted there. I'll pull out one to share here:

May 6, 1996

- **State of Nevada -** Reported Incidents Involving Spent Nuclear Fuel Shipments 1949 to Present

  http://www.state.nv.us/nucwaste/trans/nucinc01.htm

[Please note: this report, by Robert Halstead, now head of the Nevada Agency for Nuclear Projects, shows that in fact there have been accidents and incidents, including radiological releases beyond the vehicle, in high-level radioactive waste shipments from 1949 to the mid-1990s in the U.S.]

Dr. Marvin Resnikoff documented a number of these. As I myself wrote in a fact sheet (entitled “A Brief History of Irradiated Nuclear Fuel Shipments: Atomic Waste Transport ‘Incidents’ and Accidents the Nuclear Power Industry Doesn’t Want You to Know About,” dated May 16, 2002, posted online at: http://www.nirs.org/radwaste/hlwtransport/accidentshistorybrochure.pdf), referring to the Halstead report cited just above:

‘…Upon closer examination, though, innocent enough sounding “incidents” are actually quite significant. An 8/25/1980 incident is reported as “surface contamination on cask,” but there’s much more to the story, as Dr. Marvin Resnikoff revealed in his classic 1983 book The Next Nuclear Gamble: Transportation and Storage of
A NAC-1 truck cask (a Nuclear Assurance Corporation container capable of shipping one irradiated fuel assembly) was delivered to the San Onofre nuclear plant in California on August 20, 1980. Unknown to the workers about to handle the cask at San Onofre, this cask had been used four months earlier to ship a leaking fuel assembly from the Oyster Creek, NJ nuclear plant to a research facility near Columbus, Ohio. The cask had become so severely contaminated in the process that NAC added external lead shielding, to try to lower the exposure to workers and the public from the harmful radiation doses being given off.

When the empty cask arrived at San Onofre, the radiation level in the truck driver’s cab was over twice the maximum emitted 11 to 40 times the legal limit of radiation. A San Onofre health physics technician assisted – his role, to safeguard the workers’ health against harmful radioactivity. However, U.S. Nuclear Regulatory Commission (NRC) documents reveal that the technician was not qualified for this particular task: “He had no familiarity with irradiated (spent) fuel casks,” and “he received no briefing or instruction with regard to the potential hazard” of working with this contaminated cask nor even “what procedure or actions were going to be performed.”

The NAC technicians opened a capped pipe leading to the interior of the cask. Highly contaminated water began pouring out. One NAC worker caught it in a plastic bag and measured the radiation. The water emitted up to 100 rems/hour of radiation, a level high enough to deliver a lethal dose to an adult after just five hours of whole-body exposure. Shorter exposure time to such intense radiation can also lead to other forms of severe health and genetic damage. The NAC workers used a paper towel to wipe up moisture in the pipe. The paper towel then gave off an even higher

300 rems/hr. One NAC worker attempted to place the plastic bags filled with contaminated waste into a shielded container. When it wouldn’t fit, “he held his breath, turned his head, pushed the bags into the cavity while puncturing them with a screwdriver”. No standard air samples were taken, and no proper respiratory safety equipment was used. NRC later fined San Onofre $125,000 for lax health physics supervision. Water samples showed that contamination was so high that the release of several gallons of water from this cask could have resulted in billions of dollars in clean up costs.

The very same NAC-1 cask later exceeded its radioactive decay heat temperature limit, had a leaking valve, and had a radioactive “hot spot” that mysteriously moved from one end of the cask to the other after it had been decontaminated several times.
In Feb., 1981 another NAC-1 cask at Oyster Creek was found to have surface contamination, even though it was empty and had not shipped fuel for five months. A layer of heavy paint was applied to hold the contamination in place during the cask’s next journey, to Ohio. However, water soluble paint was used. It began to dissolve during a rain storm in Pennsylvania. The drivers noticed the paint peeling off, but continued on, apparently oblivious that radioactive contaminants were probably falling off onto the highway for hundreds of miles. How much radiation was released will never be known. NAC took 5 days to report the incident to NRC, which then took no action anyway.

High surface contamination incidents continued. Casks arrived at the La Crosse, WI nuclear plant with radiation levels 90 times the legal limit. NRC allowed the casks to be used, merely requiring them to be wrapped in a large plastic bag. Only after the shipments were completed did NRC require the casks to be decontaminated. Unfortunately, the La Crosse management did not warn their workers about the cask, and several were contaminated when they handled it without gloves. The NRC reported that in less than a year, this particular cask had excess surface contamination 7 times, and released some radiation during transit.

NAC also had used faulty casks for more than 5 years, from 1974 to 1979, to ship irradiated fuel more than 300,000 miles. The casks bowed out of shape, a defect that NRC noted could compromise its crashworthiness. However, NAC only reported bowing problems after shipments had been completed. Eventually, 4 of 6 NAC-1’s were pulled from the road due to the bowing problem. The NAC-1 had been regarded as the “workhorse” of irradiated fuel transport in the U.S. before its problems surfaced…’.

Given the fact that a NAC-LWT cask is proposed for this very risky shipping scheme involving liquid high-level radioactive waste, and the documented problems with NAC casks over the years and decades, it is all the more incumbent for CNSC to carefully consider the environmental impacts of this proposal. Full public hearings and an extended public comment opportunity should be allowed.

And there have been more high-level radioactive waste shipping incidents since those documented by Halstead and Resnikoff mentioned above. For example, high-level radioactive waste trans-shipments, from other Carolina Power and Light reactors, into the Shearon Harris nuclear power plant's storage pool in North Carolina, were jumped by escaping prisoners. The escaped prisoners jumped on board the train, then jumped back off and fled after encountering train personnel. It showed how vulnerable these shipments are, that they could be jumped by
escaped prisoners in the first place. They are very vulnerable to terrorist attack or sabotage, as Nevada has shown for two decades now.]

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Kevin Kamps
Radioactive Waste Watchdog
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Beyond Nuclear aims to educate and activate the public about the connections between nuclear power and nuclear weapons and the need to abandon both to safeguard our future. Beyond Nuclear advocates for an energy future that is sustainable, benign and democratic.
Comments on Certification of NAC-LWT for transport of highly radioactive and fissile liquid Highly Enriched Uranyl Nitrate Liquid (HEUNL) waste on Public Interstate Highways from Chalk River Ontario to Savannah River Site South Carolina

February 9, 2015

Dear Canadian Nuclear Safety Commission Consultations,

Don’t Waste Michigan goes on record in opposition to the proposed shipment / transportation of HEUNL which includes liquid high level nuclear waste from Chalk River, Ontario to Savannah River, South Carolina.

As recent as January 30, 2015 the Nuclear Regulatory Commission in docket 07109225 has acknowledged in the scant and obscure public record that: Non-Conformance Information has been declared “Proprietary”; That Quality Assurance and Weld Inspections are not in compliance and are non-conforming; That Inspectors were not qualified to perform Quality Assurance; That Cask Hardware is not in compliance and non-conforming; That there are currently multiple revisions under way on Cask Certificate of Compliance; That Safety Analysis Reports have been redacted and are under revision and are hidden from public scrutinization.

Don’t Waste Michigan advises the Canadian Nuclear Safety Commission to first do no harm.

These proposed shipments are among the most volatile of all radioactive wastes and risk criticality accident scenarios which have been unaddressed. This is an economic boondoggle and must not proceed. The HEUNL must be solidified in Canada and citizens of Canada and the United States should not be put in harms way to support unnecessary and ill advised shipments.

Do not ship by road, rail, barge the HEUNL from Chalk River, Canada to the Savannah River Site in South Carolina. 
Don’t Waste Michigan calls for Public Hearings and Panel Reviews. We look forward to participating and testifying at those forums.

We call on the Canadian Nuclear Safety Commission to manage the HEUNL highly enriched radioactive liquid waste at the site where it was generated.

First do no harm!

Thank you
Respectfully Submitted,
To Whom it may concern,

Please reconsider your choice to ship highly radioactive liquids from Canada all the way down to North Carolina. Please review this dangerous and unnecessary procedure. Consider turning the liquid waste into solid waste so that it can be better transported and maintained. The chance for something horrific to happen is just too high.

Thank you for your consideration.

--

Robert Vetter
9th grade physics/design/engineering
High Tech High North County
1420 West San MArco Blvd.
San Marcos, CA 92078

To visit my Digital Portfolio click here: http://rvetter.weebly.com/
Please don't ship radioactive wastes over our roads. My son lives in North Carolina, and I want to protect him and others who use the roads. This is not right. You need to do a full and honest environmental review. Don't be the cause of future cancers. Furthermore you could even get hit with future law suits if there is environmental impact.

Thanks so much,

Joanne D'Antonio
Los Angeles, CA
To: The Canadian Nuclear Safety Commission (CNSC)

Do NOT ship highly radioactive liquid wastes over our roads, and do the right thing, by protecting our communities and our watersheds (including the Great Lakes, which the shipments would have to cross at some point) which hold 90% of north America's fresh waters and provide drinking water for over 40 million people, at least $4 billion in fisheries, (and is also critical for agriculture, tourism and unique ecosystems). We call on the CNSC to hold a full environmental review with a public hearing.

Thank you.

Jane Danjin

@#@#@#@#@#@#@#@#@##

Jane Danjin
518 Rawlins St, Apt. 3
Port Huron, MI 48060
810-987-2892

@#@#@#@#@#@#@#@#@##
I am calling on the Canadian Nuclear Safety Commission (CNSC) to **NOT** ship these highly radioactive **liquid** wastes over our roads, and to do the right thing, and protect our communities and our watersheds (including the Great Lakes, which hold 90% of north America's fresh waters and provide drinking water for over 40 million people, important fisheries, also critical for agriculture and tourism) - by **holding a full environmental review with a public hearing.**
Dear CNSC

I do not support increased trafficking of radioactive materials on Ontario Highways. I am concerned because I learned that 1 in 7 vehicles carrying radioactive materials are unsafe. These unsafe vehicles are a threat to public security. The risk to the general public from a spill or accident involving radioactive material is too great for the public to bear.

Lorraine Rekmans
Osgoode, On
K0A 2W0
HIGHLY ENRICHED URANIUM SHIPMENTS FROM CHALK RIVER, ONTARIO TO SAVANNAH RIVER, SOUTH CAROLINA? BAAAAAD IDEA!!!!!!!!!!

Thank You,
Shannon Rudolph
P.O. 243 Holualoa, Hi. 96725
Supplemental Comments on Certification of NAC-LWT for transport of highly radioactive and fissile liquid Highly Enriched Uranyl Nitrate Liquid (HEUNL) waste on Public Interstate Highways from Chalk River Ontario to Savannah River Site South Carolina

February 9, 2015

Nuclear Information and Resource Service www.nirs.org

Hereby submits these comments and attached documents, plus all those referenced herein as comments on the Public Consultation on Highly Enriched Uranyl Nitrate Liquid (HEUNL) transport package design

VIA EMAIL: consultation@cnsc-ccsn.gc.ca

This proposed shipment of highly radioactive, highly enriched (so fissile) LIQUID should be simply canceled. The material should be stabilized first at the very least, but better yet, the Canadians should reject any further HEU and sign-on to protect and preserve what it currently has.

The circumstances of the proposed shipment of highly radioactive waste that is also fissile and LIQUID are unprecedented. As a precedent, such a program certainly qualifies for a complete environmental review. Without full consideration (and, likely even with such a review), shipment of liquids that are lethally radioactive and subject to criticality (and therefore of interest to malicious forces) is both frivolous and brazen violation of the public trust in federal regulators in two fine Nations. Both the US NRC and CSNC profess a commitment to health, safety and security. Let’s see that upheld; certification of the NAC-LWT for transport of highly radioactive highly enriched uranyl nitrate is contrary to public health, safety and our common defense.

Skipping over a complete EIS (under the US National Environmental Policy Act) relegates the consideration of justification of cost / risk of the overall program in the context of a container approval, and then in the context of a particular shipment approval. This is not appropriate and also not adequate.

Real Context:

Apparently the USA and Canada plan, not only to ship liquid highly radioactive fissile liquids thousands of miles from Chalk River to Savannah River Site; these federal nuclear regulators intend to make an ongoing practice of it.1 See attachment 3, concerning NEW export of HEU from the USA to Chalk River to replicate the processes that produced the HEUNL in question here.

As far as we can discern from the publicly available documents, the only reasons to ship highly radioactive fissile materials in liquid form are: 1) Canada might become a break-out nation and make nuclear weapons out of this stuff (non-proliferation is given as the framing “benefit” and 2) it might cost money to stabilize the HEUNL solution in Canada and then re-dissolve it in South Carolina.

Since this “real” cost is not disclosed, it is difficult to juxtapose it versus the stated “benefit” of moving this material. Neither of these framing pieces address the obvious risk and potential cost of the
transports. Container certification is not a frame in which broader concerns will be addressed. When and where will these very real issues be addressed:

Routine shipments will still be fraught with security concerns, ongoing radiation exposure to personnel, erratic exposure of the public to gamma rays, and potential for surface contaminants being left behind along the way.

Environmental and health consequences of a serious accidents where the payload is liquid are hard both to imagine and also to dismiss. Circumstances where release to bodies of water, percolation into soil and airborne release (explosive? Via smoke? ) to urban centers would have impacts that would be extremely expensive in consequences to public and private property, let alone the health consequences.

- The CNSC will not allow the shipment of any nuclear materials unless there is adequate provision for the protection of the health, safety and security of Canadians and the environment.

- A package that has safely transported more than 3,700 shipments of spent fuel, high-level waste and other nuclear materials around the world will be modified specifically to accommodate inner containers to hold the HEUNL.


How can CSNC say there has been adequate provision for protection when demonstrably in the very next quote (same page) the regulator acknowledges that there is no prior shipment of this material and that the container’s modification is UNIQUE—“modified specifically.”

Comments on Container:

This proposed shipment of highly radioactive, highly enriched (so fissile) LIQUID should be simply canceled. The material should be stabilized first at the very least, but better yet, the Canadians should reject any further HEU and sign-on to protect and preserve what it currently has.

Nuclear Information and Resource Service has signed comments submitted by Citizen’s Environmental Coalition, and incorporate by reference the comments of Radioactive Waste Management Associates (Dr Marvin Resnikoff) here.

We add here in addition:

HEUNL = Liquid that is fissile with highly radioactive fission products

These shipments are unique, with no previous precedent upon which ANY claim of review could rest. Prior experience that does not constitute a precedent are:

Highly Radioactive Fission products SOLID (irradiated fuel or canisters of fuel rod bits)

Fissile Liquid (HEU in blending processes) – with no fission products
There is no prior experience with shipment of a high concentration of both fissile and fission materials...and none with both of these in liquid form.

Further and perhaps most important, there is no experience of shipping highly radioactive and fissile nitrates. This final issue of the nitrogen component should not, under any circumstance be dismissed. Accident, particularly thermal, but also those involving unique harmonics cannot be modeled based on fissile or radioactive scenarios that do not include the chemistry introduced by the nitric acid in this plan.

“The transportation of liquid containing HEU (known as Highly Enriched Uranyl Nitrate Liquid, or HEUNL) is done in specifically designed containers (also called “casks”) which meet both Canadian and international safety requirements.”


This is a false statement. There are no international safety requirements for the international shipment of this material in common commerce. None. There is no previous experience. Likely, if it is to become a common practice there should be safety requirements developed for it. In fact, it is this author’s belief that these unprecedented liquid shipments across national borders are being pursued for (unstated) purposes of establishing precedent. There are commercial interests that would like to offer liquid nuclear fuels that would generate highly radioactive liquid wastes. This program should not be used to establish a precedent for anything except rejection of such shipments.

The Regulators cannot assert that the record of transporting highly radioactive wastes is clean; nor is the record of shipping liquid fissile materials. There have been documented shipments of HEU shipments having real problems – fire on a truck carrying UF8 was documented in The Nuclear Monitor by WISE (World Information Service on Energy) in Ohio in 2013; the shipment originated in Canada.

Presumably this truck and its payload were considered “safe” and “reliable.” We are all pleased that the driver was so personally conscientious that when safety fell to him he was “reliable” to the point of personal injury in the effort to protect his cargo from the flames. See: http://www.wiseinternational.org/node/4175 In our view that driver was a casualty of the cavalier assumptions of regulators.

Another such case was when the career professionals at Nuclear Fuel Services allowed a tanker than had carried a partially down-blended batch of uranium to travel in a tanker on I-26 southward towards Savannah River Site through the Asheville NC area when dripping liquid from the back of the trailer was spotted by a driver sharing the same road. This story made it to the media, which, apparently the regulators characterize as “terrorists” to the personnel of nuclear shipping contractors (as told by the fellow with the burning UF8 truck). Who, we ask, is spreading deadly, cancer causing materials through our communities? The media?

In order to set themselves apart from the alleged terror agents, the regulators must place themselves squarely on the side of those who would be impacted most: little girls...and everyone else too, but did you know that gamma doses are twice as likely to result in cancer at some point in her life when a little girl is exposed, compared to a boy in the same cohort? vi CSNC, can you stand up, with full credibility and
say you are taking action that WILL protect little girls? They are not a “sub population” they are integral to the human life-cycle.

This proposed shipment of highly radioactive, highly enriched (so fissile) LIQUID should be simply canceled. The material should be stabilized first at the very least, but better yet, the Canadians should reject any further HEU and sign-on to protect and preserve what it currently has.

Nonetheless, the matter of terror cannot be set aside. As everyone accuses the other of being the “bad guy” the fact remains that ALL of our most “official” assessments of risk from the transport of highly radioactive waste ALSO set aside the matter of malicious attack on the shipment. For instance, the (US) National Academy of Science in its “Going the Distance”vi state in the Summary of the report:

- Malevolent acts against spent fuel and high-level waste shipments are a major technical and societal concern, but the committee was unable to perform an in-depth examination of transportation security because of information constraints. The committee recommends that an independent examination of the security of spent fuel and high-level waste transportation be carried out prior to the commencement of large-quantity shipments to a federal repository or to interim storage (see Section 5.1).

No such examination has been made that is available to the public; indeed, there is no commonly made reference to any classified report as well. This writer agrees that some security information should / must be withheld from public access. Nonetheless, it has been publicly established that containers that are designed for transport of SOLID waste (including the NAC brand) are vulnerable to ordinance that, unfortunately, thanks to the NRA in the USA, is readily available for sale to civilians. See: Halstead, Ballard and Dilger 2005.viii The same endnote has a reference to a report that Nuclear Information and Resource made of a video of the US Army testing CASTOR (far more robust than the NAC) with a TOW missile… it failed. It was also not holding liquid inside.

This is a fine place to stop and say that a Tow Missile test by the US Army is the ONLY physical testing of a transport container to destruction EVER. All other testing to establish compliance with safety standards (there are no security standards) is done with computer models—and the actual container scenario is performed with nothing more than a hand-held calculator.

This proposed shipment of highly radioactive, highly enriched (so fissile) LIQUID should be simply canceled. The material should be stabilized first at the very least, but better yet, the Canadians should reject any further HEU and sign-on to protect and preserve what it currently has.

IT should be noted that in the past, the same wastes have been mixed with stabilizers and retained in Canada as waste. The departure from this practice must be weighed against the very real safety, health and security concerns of putting such material on the interstate highways, on bridges and through major urban areas (Charlotte, NC for one).

The scope of this technical assessment is for the certification of the package design only. The CNSC has not yet received an application to transport or export HEUNL to the U.S.

NIRS-4
Is the NAC-LWT cask as modified for HEUNL shipment also being certified for STORAGE of the liquid HEU and fission products? It is not clear that the material would be immediately off-loaded at Savannah River Site. Is the cask being considered for extended storage? If it is not being certified for extended storage, and such storage becomes a necessity, what will the recourse for the public be?

Under US regulations a nuclear shipment may extend in time up to two years. If there are circumstances that required extended delays in transport what are the consequences of this unplanned “storage?” Is the NAC-LWT up to the job?

Stated concerns in others comments are echoed here for emphasis: are the Teflon O-rings at risk for failure if radiation exposure is extended?

Even if the storage of a single shipment is not extended, repeated shipments may impact these components over time. What is the assurance that these will be changed?

The presence of both nitric acid and fission products undergoing decay will generate combustible gases. Are these adequately factored in assessment of extended storage of highly radioactive HEUNL?

To frame these concerns, along with the health consequences of loss of container integrity:

For instance, see: http://en.wikipedia.org/wiki/Uranyl_nitrate

Uranyl nitrate is an oxidizing and highly toxic compound. When ingested, it causes severe renal insufficiency and acute tubular necrosis and is a lymphocyte mitogen. Target organs include the kidneys, liver, lungs and brain. It also represents a severe fire and explosion risk when heated or subjected to shock in contact with oxidizable substances.

And http://cameochemicals.noaa.gov/chemical/12958

**General Description**

Acidic solution in water of uranyl nitrate, a radioactive yellow crystalline solid. Mildly toxic. Contains nitric acid. Noncombustible, but will accelerate the burning of other combustible materials if concentrated or if the water evaporates. Large quantities may explode if exposed to fire. Produces toxic oxides of nitrogen if involved in fire. Radioactive materials emit certain rays which can be detected only by instruments. Unirradiated uranium is only mildly radioactive. Minimal radiation hazard during transportation. No protective shielding is required. Non-fissile (natural or depleted) uranium, containing not more than 1.0% u-235, cannot sustain a nuclear chain reaction.

Note that the readily available material ASSUMES that HEU would not be in a nitric acid solution... and further that the uranium would be UNIRRAIDIATED. These shipments have no public context at all, and Nuclear Information and Resource Service urges CNSC to reject the development of such experience. Deny this certification. Turn away from establishing a record liquid shipments – whether routine or otherwise. The risks are too great.

Respectfully Submitted,

--------/s/-------------

Mary Olson
Radioactive Waste Specialist
Nuclear Information and Resource Service
www.nirs.org maryo at nirs.org
Liquid Radioactive Waste Shipments On I-81

As we reported in our Spring Newsletter, high-level waste in liquid form is expected to rumble down I-81 from the Chalk River reactor in Canada. Over 50 shipments, at most two shipping casks to a shipment. Even though the shipments of highly enriched uranium (HEU) are under Department of Energy (DOE) aegis, it is the Nuclear Regulatory Commission (NRC) who must approve the cask, NAC-LWT together with its contents. The cask itself has been approved for all sorts of contents, all solid. But the liquid has put the NRC into a deep and secret debate. And we will shortly tell you why, but first, a brief commercial interlude.

A total of about 23,000 liters of the highly radioactive liquid would be moved in batches of a few hundreds liters at a time, the first attempt to truck liquid HEU in Canada. Chalk River is located in northern Ontario (see map). It is about 2,000 kilometers from Chalk River to DOE’s Savannah River Site in Aiken, S.C.

According to DOE, the shipments will cross into New York State, likely over one of five Canada-U.S. bridges. While the exact route, timing and security details are proscribed under Canadian and U.S. law, past history (see map) suggests shipments will enter New York State over the Ogdensburg bridge, near Clayton, New York. The shipper is Atlanta-based NAC International, designer of the NAC-LWT cask.

The repatriation of HEU falls under the National Nuclear Security Administration’s (NNSA) Global Threat Reduction Initiative. By eliminating stockpiles of excess nuclear materials that could be used for weapons at civilian sites around the world, the NNSA’s action supports permanent nuclear threat reduction. Good enough, but why ship liquid highly radioactive material?

The liquid will be fed into a reprocessing plant called the H Canyon at the Savannah River facility in order to extract the residual Highly Enriched Uranium. This uranium would then be downblended to enrichment levels needed in commercial nuclear power reactors. In the past the H Canyon has been generally used for separating uranium and plutonium from highly radioactive fission products.
These are the two important questions: Why ship liquid waste? And what’s the problem?

**Why ship liquid waste?** The dissolvers in the H Canyon generally dissolve solid fuel in acid and chemically separate fission products (cesium, strontium) from uranium and plutonium. Solid HEU fuel continues to be shipped to SRP from all over the world. Solid HEU (2 fuel assemblies, 95% enriched; 3 fuel assemblies, 12% enriched) will shortly be shipped to SRP from Dounreay, Scotland, entering the Charleston, SC port. So there is no question, solid fuel can be accepted at SRP. In its environmental assessment, the DOE does not explain the rationale for shipping liquid waste, but one could make an educated guess. Rather than having AECL convert liquid waste into a solid, which AECL has done in the past, then dissolve this solid at DOE’s Savannah River Plant, DOE and AECL want to eliminate these two steps (solidification at AECL, dissolution at SRP). The liquid would be fed directly into SRP’s lines, thereby eliminating this dissolution step. This would save both AECL and DOE money. But shipping liquid increases the transportation risk. DOE has downplayed the transportation risk by citing numerous studies that relate to shipping solid fuel, not liquid. Nice try, but we got you.

**What is the risk of transporting liquid irradiated HEU?** The risk is laid out in older NRC contractor publications (Battelle Pacific Northwest Laboratory, “An Assessment of the Risk of Transporting Spent Nuclear Fuel by Truck,” PNL-2588, November 1978). For a 15 minute fire at 1850 °F, the temperature of a standard hydrocarbon fire, the rupture disk would fail; for a 30 minute fire, the closure, drain valve and vent valve seals would fail. These failures would occur some time after the fire. The PNL report and others were not cited by DOE, but hopefully will be examined by the NRC. But who knows? Thermal considerations have been redacted from all NRC reports, for questionable proprietary reasons.

When the NRC will make a final decision, when shipments will actually take place, is anyone’s guess. When and if shipments proceed, you will see a parade down I-81: two trucks carrying casks within a box, like any standard Rodeway truck, but with a strange aerial on the cab, and door slots that one can shoot from, followed by an armed to the teeth escort vehicle, and preceded by a state trooper from each respective State. Don’t mess.

ATTACHMENT #2: Excerpts from Savannah River Watch letter to the Department of Energy 02/27/2013


Given the unique nature of this shipment of liquid HEU-bearing high-level radioactive waste (HLW) and the precedent it would present, a new EIS analysis is required which would look at such things as: - origin of the HEU-bearing waste at Chalk River (waste stream from HEU target processing to recover medical isotopes); - applicable regulations for transporting and importing liquid radioactive waste; - packaging of liquid radioactive waste for transport; - proliferation implications of transport, storage and processing of HEU-bearing liquid waste; - disposal options in Canada, including disposal of similar
materials at Chalk River; - licensing process before the Nuclear Regulatory Commission (NRC) concerning HLW shipment packages by NAC International or other companies; - impact of accidents along transport routes, including total loss of contents of a shipping container during transport; - risk of terrorist acts and their impact; - storage at the Savannah River Site, including possibility of long-term storage of unprocessed liquid waste; - accidents involving storage of containers or in handling at the Savannah River Site, including loss of the total volume of a container at SRS; - processing of the waste in the H-Canyon and possible accidents; - status of the H-Canyon, its condition and upgrades that may be needed;

- remediation of possible accidents in storage or processing; - criticality risk during processing and transport; - security requirements at SRS; - radiation exposure along transport routes and at SRS to workers and the public; - length of processing campaign at SRS; - processing of recovered HEU, blending down, fabrication into fuel and shipment to nuclear reactors operated by the Tennessee Valley Authority (or other reactors); - impact of new waste streams into the SRS tank waste system and other disposal systems; - return of any portion of the waste to Canada, and - total cost to DOE of the program, including payment from Canada and costs at SRS. As this shipment could be the first of a kind that has not been analyzed before, it is of national significance and demands a thorough EIS

NIRS Comment:

An EIS has not been performed. These vital questions remain unanswered. A container certification is not going to answer them. Where and when will the potential impacts of this program, its alternatives and the cost / benefit of the proposal be assessed in a public forum?

Attachment #3 attached as PDF

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ii “...The commitment promotes non-proliferation by removing existing weapons-grade material from Canada and eliminates a nuclear liability for future generations of Canadians.” Here: http://www.nuclearsafety.gc.ca/eng/reactors/research-reactors/nuclear-facilities/chalk-river/highly-enriched-uranium-in-canada.cfm#sec5


iv For instance, see Hot Cargo: http://www.nirs.org/radwaste/ hlwtransport/hotcargoupdate2013.pdf


Shipment of irradiated fuel from Germany to LaHague France (ongoing in the 1990’s) had surface contamination in great excess of regulatory limits.


Savannah River Site Watch
SRS Watch - www.srswatch.org
Columbia, South Carolina
Media Alert
May 29, 2014

U.S. Department of Energy (DOE) Applies to Nuclear Regulatory Commission
to Export Bomb-Grade Uranium to Canada

National Nuclear Security Administration (NNSA) Seeks to Export 7 Kilograms of Highly Enriched
Uranium to NRU Reactor at Chalk River Laboratories in Ontario, for Medical Isotope Production

Plans to Ship 23,000 Liters of Liquid High-Level Waste from Chalk River
to DOE's Savannah River Site Slowly Proceeding

Columbia, South Carolina - The U.S. Department of Energy has applied to the Nuclear Regulatory
Commission for a license to export 7 kilograms of highly enriched uranium (HEU) to the National
Research Universal (NRU) medical isotope production reactor in Canada. U.S. non-proliferation experts
anticipate that this will be among the last shipments of HEU to Canada.

Notice of the export license application was printed in a notice in today's Federal Register - see links
below. The notice states that the HEU would be exported "to fabricate targets at the National Research
Universal reactor in Canada for ultimate use in production of medical isotopes."

The bomb-grade uranium is stored at the National Nuclear Security Administration's (NNSA) uranium
storage facility at the Y-12 complex at the Oak Ridge site in Tennessee. The HEU would be fabricated
into "targets" that are irradiated in the aging NRU reactor to produce medical isotopes. The HEU in the
targets is converted Molybdenum-99, which decays into the short-lived isotope technetium-99m
(Tc99m), which is used in many medical procedures.

"We hope that this among the very last shipments of bomb-grade uranium to Canada," said Tom
Clements, director of Savannah River Site Watch in Columbia, South Carolina. "For nuclear non-
proliferation reasons, use by Canada and other countries of HEU in medical isotope production and in
research reactors must cease and reactors much either halt operation or be converted to low-enriched
uranium that cannot be used in nuclear weapons. Canada and other countries must with all deliberate
speed develop and deploy non-reactor options for production of essential medical isotopes."

Clements has tracked the non-proliferation concerns associated with HEU use for many years and visited
the NRU reactor at Chalk River in 2001.

Nordion, Inc. operates the medical-isotope production facilities at Chalk River Labs, which is operated by
Atomic Energy of Canada Ltd. The Nordion board has approved sale of the company.
Natural Resources Minister Joe Oliver has stated that the NRU reactor would cease operation in 2016 and that Canada would convert to non-reactor methods to produce medical isotopes, such as linear accelerators, would be pursued. Efforts to replace the NRU reactor, which started operation in 1957, when two MAPLE reactors failed to operate when technical issues arose.

"If Canada does not halt HEU use by 2016, we will oppose any further export from the US of highly enriched uranium and consider a formal intervention with the NRC," said Clements.

To extract the Mo-99, the HEU targets are dissolved in acid and the resulting highly radioactive waste is solidified. One tank, filled with by-product waste in 2004, contains 23,000 liters of liquid high-level waste that is planed to be shipped to the DOE's Savannah River Site in South Carolina. Both DOE and the Canadian Nuclear Safety Commission have refused to prepare "environmental impact statements" on the shipment and have not analyzed management of the high-level waste (HLW) in Canada. Public interest groups have protested the shipment of the liquid HLW, including risk of en-route accidents, and pointed out that the shipment is not being done for nuclear non-proliferation reasons but rather is for waste management purposes in Canada and to make money for SRS.

At SRS, the liquid waste would be processed in the old H-Canyon reprocessing facility, to remove remaining HEU, with resultant waste dumped into on-site HLW tanks. SRS waste tanks are slowly being closed and should not be receiving new waste, according to Savannah River Site Watch.

"The shipment of liquid high-level waste is unprecedented and poses risks in transport and handling," said Clements. "We strongly oppose the dumping of nuclear waste by Chalk River on the Savannah River Site, where it will put strain on an already challenged waste-management system," said Clements. "If the waste import is still being considered, DOE must prepare an environmental impact statement involving public participation and, for nuclear non-proliferation reasons, must focus on management of the waste in Canada."

SRS Watch learned on May 28 that the Nuclear Regulatory Commission has finished reviewing the license application for the liquid HLW shipping cask by NAC International but has further questions of the company. Review of a response to new "request for additional information" (RAIs) will take another 8 weeks and then a "certificate of compliance" could be issued or more questions could be sent to NAC International. The Canadian Nuclear Safety Commission has evidently not licensed the transport cask in Canada and may move to do that after the US license the cask for liquid waste shipment.

Notes:

1. A copy of group letter to DOE asking for an EIS on liquid HLW shipment is available on request.

2. Federal Register notice of May 29, 2014:


NUCLEAR REGULATORY COMMISSION

Application for a License To Export High-Enriched Uranium

Pursuant to 10 CFR 110.70 (b) 'Public Notice of Receipt of an Application,' please take notice that the Nuclear Regulatory Commission (NRC) has received the following request for an export license. Copies of the request are available electronically through ADAMS and can be accessed through the Public Electronic Reading Room (PERR) link http://www.nrc.gov/reading-rm.html at the NRC Homepage.

A request for a hearing or petition for leave to intervene may be filed within thirty days after publication of this notice in the Federal Register. Any request for hearing or petition for leave to intervene shall be served by the requestor or petitioner upon the applicant, the office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555; the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555; and the Executive Secretary, U.S. Department of State, Washington, DC 20520.

A request for a hearing or petition for leave to intervene may be filed with the NRC electronically in accordance with NRC's E-Filing rule promulgated in August 2007, 72 Fed. Reg 49139 (Aug. 28, 2007). Information about filing electronically is available on the NRC's public Web site at http://www.nrc.gov/site-help/e-submittals.html. To ensure timely electronic filing, at least 5 (five) days prior to the filing deadline, the petitioner/requestor should contact the Office of the Secretary by email at HEARINGDOCKET@NRC.GOV, or by calling (301) 415-1677, to request a digital ID certificate and allow for the creation of an electronic docket.

In addition to a request for hearing or petition for leave to intervene, written comments, in accordance with 10 CFR 110.81, should be submitted within thirty (30) days after publication of this notice in the Federal Register to Office of the Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Rulemaking and Adjudications.

The information concerning this application for an export license follows.

NRC Export License Application

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[[Page 30904]]

For The Nuclear Regulatory Commission.

Dated this 15th day of May 2014 at Rockville, Maryland.

Michael J. Case,
Acting Deputy Director, Office of International Programs.

[FR Doc. 2014-12481 Filed 5-28-14; 8:45 am]
BILLING CODE 7590-01-P

3. DOE’s Supplement Analysis (prepared in secret & without public input) and Amended Record of Decision on import of liquid high-level waste from Canada:

http://energy.gov/nepa/downloads/eis-0279-sa-01-supplement-analysis

The Canadian Nuclear Safety Commission (CNSC) should NOT ship these highly radioactive liquid wastes over our roads, and to do the right thing, and protect our communities and our watersheds (including the Great Lakes, which hold 90% of north America's fresh waters and provide drinking water for over 40 million people, at least $4B in fisheries, also critical for agriculture and tourism) - by holding a full environmental review with a public hearing. They may not ship through Michigan, but they could if they so chose. (One of the Buffalo NY papers stated that Michigan might be an alternative route. If so, they couldn't ship it on the Ambassador Bridge or through the tunnel as neither one allows dangerous goods. They would have to ship it at the Blue Water Bridge down I-94, (from Chalk River, ON by the Quebec border to Savannah River Site in North Carolina) or the long way at Saulte Ste. Marie.)

No matter which route they ship it, it sets precedence in the U.S and Canada for shipping highly radioactive liquid wastes, which have never been shipped on U.S. or Canadian public roads before. These are a proliferation risk, so could be targeted by terrorists. In the past many years, Canada has downblended these dangerous wastes and stored them onsite as a solid. Certainly, there is no good reason why they could not do that now.

Thank you,
Mary Ann Baer
ATTENTION/DEAR CNSC~

This will be such a huge mistake to make the decision of transporting Such Powerful Hazardous RADIOACTIVE LIQUID, on the roads. Think of your families, and the environment. Your families are part of this generation that is going to have live with the Hazards of chemicals that if they survive. We have enough toxins that are being transported throughout the USA and CANADA that is damaging our children's and Grandchildren's future. Humans/Mankind have done enough careless acts of toxins being spilled in our Oceans, Lakes, and Rivers, now you want to poison the roads with Highly Radio Active Liquid. For the sake of your children and grandchildren and future generations, PLEASE DO NOT ALLOW THIS TO CONTINUE OR HAPPEN.

SINCERELY,
Donna Harden
Vista, California
I urge that public hearings be held on the proposed shipments from Chalk river to Savannah Georgia.

The liquid wastes should be solidified, so that if an accident happens the clean up can be accomplished. This would be almost impossible with spills of liquid wastes. Furthermore solidifying liquid wastes is not rocket science. It is easy and inexpensive to do.

The probabilities of a spill may be small but the consequences of a spill are significant, serious and impossible to remediate.

Why were no public hearings held? Who decided and by what authority?

Please reply,

Ernest Goitein
Canadian Nuclear Safety Commission:

Re: Application for the transport of Highly Enriched Uranium in liquid form, from Chalk River, Ontario to Savannah River, South Carolina

Shipping highly radioactive waste in liquid form over public roads is unwarranted. It sets a dangerous precedent, as it could legitimize future shipments of liquid radioactive wastes on a global scale. This plan must be halted and a public decision-making process instituted to deliberate on this matter, for the safety and protection of the public, and for the sake of international security.

As a US citizen, and, more importantly, as a global citizen, I implore you to suspend plans for such transport until you have held a full environmental review with a public hearing.

Sincerely,
Paula Colby
Why were there not public hearings on this very risky transit proposal? This really seems insane! Are there no protections of citizens or the environment? Please put an immediate halt to this potential threat to safety.

Thank-you,

Sally O’Connor Peck
Livonia, MI
To the Canadian Nuclear Safety Commission:

I am writing to the CNSC to urge you to not allow shipment of highly radioactive liquid wastes over our roads and that you hold a full environmental review with public hearing.

- Shipping highly enriched uranium in liquid form would set a precedent in the U.S and Canada for shipping highly radioactive liquid wastes, which have never been shipped on U.S. or Canadian public roads before.
- Shipping overland would endanger the Great Lakes, which hold 90% of north America's fresh waters and provide drinking water for over 40 million people, important fisheries, and is also critical for agriculture and tourism.
- The transport package was designed and has been used for solid radioactive waste, not liquid, and must be amended if it is to be used for the transport of liquid waste.
- Shipping highly radioactive waste in liquid form over public roads is unwarranted. It sets a dangerous precedent, as it could legitimize future shipments of liquid radioactive wastes on a global scale. The plan to ship this waste must be halted and a public decision-making process instituted to deliberate on this matter, for the safety and protection of people and the environment, and for the sake of international security.

Radioactive waste and its cancer-causing, health-eroding, DNA mutating emissions last virtually forever - half-life of thousands of years. No amount of money made in the short term justifies this long term destruction of our environment, genetic health and safety. Those of us who speak against this short-sighted plan are the conscience of an industry that does not want one... but it’s time to listen, take the long view and act on behalf of safety, as well as sanity.

Sincerely,

Libbe HaLevy.

Libbe HaLevy, M.A., CAC
Communications and Creativity Expert
Heartistry Communications
The Heart of the Art of Communicating
818-353-8399

Now on Amazon Kindle by Libbe HaLevy: Yes, I Glow in the Dark! One Mile from Three Mile Island to Fukushima and Beyond Buy now at: http://amzn.to/1IINo2w

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To Whom It May Concern,

I am strongly against any radioactive waste being transported to the U.S. from Canada. I don’t want any radioactive waste being transported anywhere...liquid or solid. It’s bad enough that the poison continues to be made around the world thereby negatively affecting the health of the entire planet but Canada should keep it on site in your own country.

Nancy Nolan
Red Bluff, CA
USA
February 9, 2015.

Sent via email to consultation@cnsc-ccsn.gc.ca

Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street, Ottawa,
Ontario, K1P 5S9.

Re: Comments on Technical Assessment Report – HEUNL Shipments

CNSC Tribunal Members:

Durham Nuclear Awareness (DNA) is a volunteer group of concerned citizens dedicated to raising awareness about nuclear issues and risks facing the communities of Durham Region. While our focus is primarily on matters of direct concern to citizens within the Region, we are aware of serious and overarching issues around the handling and transportation of nuclear wastes.

Notwithstanding the assurance that “Canada has an excellent safety record for the transport of nuclear substances,” we have a number of concerns about this technical report and the possible ramifications of its endorsement by CNSC staff who “are satisfied it meets all Canadian and international regulatory requirements and will ensure the protection of the public and the environment.”

We would like to acknowledge that this issue, as with many nuclear issues, is a matter of technical complexity well beyond the understanding of the average person. Fortunately, there are knowledgeable individuals on both sides of the border who do grasp the technical issues, and whose concerns we share.

We are aware of the following matters of serious concern with respect to the technical assessment report:

- The external package in question – the NAC-LWT – has up until now been used only for solid materials, never for liquid.
- While claims about plans for modification are made, design details are not available due to “proprietary” considerations.

How can the Canadian (or indeed the American) public have any confidence in the safety of a container about which essential details are being kept secret?
Additional issues:

- Large numbers of citizens on both sides of the Canada/U.S. border and along 2000-kilometer route(s) are being asked to be unwitting guinea pigs for these unprecedented shipments.
- Most citizens (and indeed politicians and other public officials) have no knowledge of the complexity of the materials involved, the politics involved, the risks involved, and the fact that this is an unprecedented set of circumstances.
- The actual need for this dangerous and unprecedented series of shipments has not been demonstrated.
- It is acknowledged that workers and members of the public may or will receive a radiation dose even if there is no “accident.” Claims that this will be “below regulatory limits” offer no comfort to those who may unwittingly and unwillingly be exposed.
- We are aware that there are routine accidents and incidents involving leaks of nuclear material, and that these accidents/incidents/leaks are not necessarily even reported to the nuclear regulator! 1
- The authority for emergency response falls to municipal, regional or provincial (or presumably state) agencies that are in no way adequately educated or prepared for the kinds of consequences that would result from a spill of liquid nuclear waste containing a dangerous cocktail of highly toxic radionuclides / chemicals.

Conclusion and Recommendation

Unfortunately, the unthinkable does indeed happen. And not even rarely. So we have learned from the Three Mile Island, Chernobyl, Fukushima and Lac Megantic disasters, to name but a few.

There is a whole history of risks, incidents and accidents involving the transport of nuclear waste.

In our view, it is unacceptable that a project of this magnitude and potential danger not be subject to a public hearing at which the potential need, risks and alternatives may all be fully discussed and explored – among nuclear experts, citizen experts, “regular” citizens and public officials.

Transportation of nuclear wastes is much too risky to leave in the hands of a “designated officer” at the CNSC.

We believe strongly that a full and transparent public review of this proposal is essential.

Sincerely,

Janet McNeill
DNA Coordinator

Durham Nuclear Awareness (DNA)
c/o 206 Byron St. North
Whitby, ON L1N 4N1.

1 http://www.wiseinternational.org/node/4175
To whom it may concern:

It is insane to ship highly radioactive liquid nuclear waste by truck or rail.

Don’t ship it at all except in solid form. Even better, don’t ship it at all. Best: stop making it, period.

Future generations will judge you for this.

Sincerely,

E Gogol

Chicago IL USA
Dear Canadian Nuclear Safety Commission:

Attached are two documents on high level radioactive LIQUID WASTE pertaining to planned shipments from Chalk River in Canada to southeastern USA. Please consider these official documents being submitted to you for the first time with the understanding that they fully pertain to you, but were prepared for use internally within the USA. Read them as if your name appeared on the address to line, and please forgive me that I didn't have sufficient time to rework them.

I can not urge you strongly enough to please, please, do not start a reckless precedent to ship highly radioactive LIQUID waste over public roads, bridges, streams, and waterways in Canada and in the USA. Obviously, any such shipments are too risky, specifically due to the extreme danger of the nature of this type of permanent toxicity and its lethal properties to humanity and most other living organisms. This horrid toxicity that requires absolute containment for centuries can not be permanently contained forever, particularly with the existing imperfect technology that we have combined with the type of reckless and negligence involved in accidents and mistakes that mankind has proven itself capable, such as at Fukushima, Chernobyl, and much more lesser known disasters and environmental exposures of highly dangerous nuclear radiation after promises and assurances by decision-makers that would never happen, but it did. These accidents that are man-made always happen in time. Any risk factoring always involves time. The problem is that the assumption of safety does not factor in what happens when that time occurs, and this is negligence and foolish. As a result of this similar recklessness, now we may not ever have any safe food from the Pacific Ocean again that is not contaminated with some radioactive cesium or other fissionable materials, but nobody wants to talk about that awful reality. It is just so horrid that we humans seem to have a great need to turn to irrational denial in order to avoid the stress this causes our bodies and minds. While our background radiation levels in the Great Lakes were up to 32 for a couple years, they have dropped down to 25 in Wisconsin, but they have not returned to 11 where they were in Germany just prior to Fukushima. These are contaminated background levels that did not exist prior to Fukushima. Contaminated background levels occurred in isolated areas prior to the nuclear age less than a century ago, but now they occur globally. Humans can no longer escape background radiation which has grown and grown larger and larger over the past century. It takes 4 generations of humans being born before the damaging genetic effects of Hiroshima, for example, will be known, and we are barely on that emerging threshold. I am very skeptical that humans will be able to reproduce in the future due to this insanity of decision-makers who were negligent, reckless, and not properly considering the actual risks involved with not being able to fully contain high level radioactivity and keep it isolated from human exposure and human genetic damage. Every exposure to any level of radiation causes known
membrane damage to red blood cells. Every exposure theoretically carries genetic
damage, but that damage will not be seen until the entire group of offspring 4
generations later is examined. This information was well known when we started the
nuclear age. Such risks can not be justified to your children and your grandchildren.
Yet we are seeing not just 1 in 2 or 3 adults with cancer but higher and higher levels
of childhood cancer in the last decade, with major epidemics of thyroid cancer
throughout the US and Canada which is scientifically known to be caused by
radiation exposures from nuclear bombs, from nuclear waste leaks, and from
Chernobyl. We must protect what is left of the most populated Northern Hemisphere
of Planet Earth from insanity. We already have major portions around Chernobyl that
will continue to be radioactive beyond our lives and now around Fukushima involving
the entire Pacific Ocean all the way to the USA's west coast and the Canadian coast
based on fish measurements of cesium.

Both the nations of the USA and Canada are fully aware of the proliferation risk as
well as the actual existence of terrorist attacks in both nations now. We are all aware
that terrorist activity can be expected due to our nations' overly aggressive reckless
destruction of the Middle East on falsified pretenses by former US President Bush
and his Vice President Dick Cheney that stirred up anger that otherwise might not
have been felt. We need to think better. We need to think clearer. We need to think
about the consequences of what we do. We need to be prepared for problems, but
the Gulf oil spill and Fukushima nuclear disaster prove that assurances of
preparedness have not been true when the entire world observes problems being
solved by guesswork and insufficient knowledge that should have been sufficiently
tested when policies and plans were approved, but negligently were not done by
incompetent and corrupt decision-makers, who didn't behave in the best interests of
the public and our commons. I am asking you to rise to the occasion and to be
responsible about everything.

Thank you.

Susan Michetti
605 Sheila St.
Mt Horeb WI 53572
608 334 3515
sunlightrising@gmail.com

We are the people who we've been waiting for. Speak up for justice, freedom, and
goodness. Make as many people as possible aware that respect and caring about
each individual in our global village--true community in the fullest sense--has become
of utmost importance in order to protect everyone's equality and liberty. Social
ranking of individuals is changing from economic status to that of goodness and
integrity, community action and helpfulness, assertiveness for what is right, using our
highest intelligence. We are setting the examples. The opportunity playing field
needs to be leveled, and taxing and distributing resources is the method, leaving
those performing with innovation and excellence 10 times more than the bottom. We
need to make voting mandatory if we are serious about democracy. We are the
people that we've been waiting for.
Official Testimony to the International Joint Commission on Great Lakes Water Quality
Presented by Susan Michetti, 605 Sheila St., Mt. Horeb, WI 53572 stardust10000@yahoo.com
A volunteer representing the Sierra Club’s John Muir Chapter of Wisconsin
REVISED DRAFT 9-30-2013 Re Rad Waste Transport to go to Congress, State Dept, cc. IJC

Re: Request that the IJC take various actions to stop all high level radioactive waste transport on the Great Lakes and the St. Lawrence River as well as above it by bridge and near shore as inappropriate. Such waste transport is environmentally unsafe with potential to permanently destroy this unique and irreplaceable global treasure in the case when a single catastrophic accident would occur. This is not an “if” situation, but “when,” based on numbers probabilities. The drinking water source required for the sustainability of millions of people in the USA, Canada, First Nations, and other indigenous tribal nations is too valuable and too irreplaceable to gamble with in the uncertain end result in the inappropriate game of risk probabilities, which is a sophisticated form of Russian roulette.

Dear Honorable Commissioners:

We thank you for this opportunity to provide official testimony and official requests.

The Sierra Club’s John Muir Chapter of Wisconsin opposes all transportation of “high level” radioactive waste defined here as determined by the presence of fission products, particularly on the Great Lakes and the St. Lawrence River as well as above it by bridge and near shore. The safety concerns and dangers have long been recognized as highly increased as soon as transport is introduced with radioactive waste. This includes by ship, truck, or rail. Worse yet, the design of the transport storage cask has never been adequately and thoroughly tested until destruction. The testing of transport storage casks for integrity while falling over long distances as well as during experiences with weather extremes has been inadequate; this incomplete and inadequate testing for safety lacks credibility. Transport of high level radioactive waste is unnecessary when an alternative method exists on-site, which is usually the case except when a clear actual grave concern exists. Unnecessary transportation includes, but is not limited to, the precedent-setting proposal to transport of high level radioactive waste shipments containing liquid bomb-grade Highly Enriched Uranium (HEU) in nitric acid from Chalk River Laboratories in Canada to US Department of Energy’s (DOE’s) H-Canyon facility in South Carolina. Precedent-setting proposals require intensive and thorough scientific scrutiny in order to avoid a potential large-scale catastrophe caused by human irrationality at the front-end.

Nuclear Waste Requires New Terminology with Accurate Descriptors

Terminology for radioactive waste categories requires development and replacement with accurate descriptors.

New standardized terms should accurately describe the types of radioactive waste with primary descriptive terms that covers the actual safety concerns for biological living organisms and the entire environment with similar ranges of life-spans and with similar ranges of effective absorbable radioactive dose equivalents identified in international standardized measurement units called sieverts. Definitions for terminology should identify the specific dangerous isotopes that mandate the highest and most careful treatment. A series of secondary indicators should be developed that accurately describe ranges of volume, ranges of weight, ranges of radioactive substance percentage, and other pertinent descriptors.
Terminology for radioactive waste is inaccurately defined and applied as “low level,” “intermediate level,” or “high level” by different entities and/or nations. This terminology is not standardized. As a result, terms are inconsistently applied to equivalent radioactive wastes by different entities. The inconsistencies and contradictions between terms and the actual physical ionizing characteristics and life-spans, referred to by these confusing terms, create unnecessary hurdles and obstacles, which, in turn, must be surmounted in order to identify the best safety standards and best management practices to be applied in terms of known biological harms and hazards. These inappropriate catch-all terms currently generate confusion, irrationality, and errors in perceptions as well as errors in thought processes. This inaccurate terminology contributes to fuzzy thinking that interferes with efficiency and accuracy in dealing with safety concerns. Inaccurate terminology contributes to irrational decision-making that does not protect public safety from known adverse somatic and genetic effects.

A qualified scientific body, such as a re-establishment of the IJC’s Nuclear Task Force, should create a new radioactive waste terminology. This will be a difficult task to address the range of complexity and differences, but this step is required in order to improve rational decisions radioactive waste problems.

In order to improve factual communications and to eliminate unnecessary misunderstandings of a highly complex and technical issue, the re-establishment of IJC’s broad-based Nuclear Task Force would be an ideal entity to address this terminology and to standardize it by working with all the stakeholders. This task is required in order to improve rational decision-making and safety involving the ranges of complexity and differences found in radioactive waste.

**International Standardized Measurement Unit Established as Sieverts (Sv)**

The standardized international measurement of sieverts has been the appropriate absorbed ionization dose measurement unit since 1980 for ionizing radioactive quantity of absorbed dose equivalent. Equivalents: .0001 Sv = .1 mSv; 1 Sv = 1000 mSv

This international system of units made possible the interchange of units across all fields of science upon adoption by the General Conference of Weights and Measures.

All agencies evaluating proposals to transport waste should require accurate descriptions of the proposed radioactive cargo in terms of standardized sieverts in order to enable rapid and accurate comparisons and contrasts for the best management practices. If agencies do not require sieverts as the unit of measurement, then they should convert the given measurements to sieverts.

**Radioactive Health Effects Known**

The history of scientific observation and epidemiological studies that has identified adverse biological effects from blood changes through death for various absorbable ionizing dose patterns in humans has been long accepted. Medical observations from Chernobyl and Fukushima are expanding the symptoms and effects.

Almost all scientists agree that there is no dose of absorbable ionizing radioactivity that is absolutely safe from causing biological damage in humans. This proven harm is first observed with blood cell changes, which, in turn, result in changes in blood cell counts. It is not controversial statement that human and biological damage occurs with the smallest absorbed radioactive dose. Various body organs and tissues are more radiosensitive than others and induce more damage quicker and with smaller doses from external radioactive ionizing fields. (Mary Alice Statkiewitz et al, *Radiation Protection in Medical Radiography*, 1993.)

Basically, medical textbooks identify the following adverse health effects from historic exposure measurements and observations: 0.25 sieverts results in blood cell damage; 3.0 sieverts results in death to 50% of the exposed population; and 6.0 sieverts causes death to most of the exposed population.
This is not controversial. (Mary Alice Statkiewitz et al, *Radiation Protection in Medical Radiography*, 1993.)

The ability of repair mechanisms to fix the cell damage becomes less effective with increased exposure in healthy people and organisms. People who do not have optimal health likely have repair mechanisms that are less able to fix the damage, if at all, including at low level radioactive exposure. The ability of repair mechanisms involves unknowns.

**Radioactive Protection Goal**

Radiation protection is defined in National Council on Radioactive Protection and Measurements (NCRP) Report # 91. The goal is to limit “the probability of radioactive induced diseases in persons exposed to radiation which are defined as somatic effects (all physical changes including death) and genetic effects (all changes to progeny) to a degree that is reasonable and acceptable in relation to the benefits from the activities that involve such exposure.”

In 1954, NCRP established the concept that radioactive exposure should be kept “As Low As Reasonably Achievable” which is also identified by ALARA. All regulatory agencies accept this. The amount of biological damage is directly proportional to the amount of radioactivity absorbed. Radioactive damage does not start at a threshold of exposure below which safety can be enjoyed. There is no known level of radioactive dose below which a human has zero probability of sustaining biological damage. (Mary Alice Statkiewitz et al, *Radiation Protection in Medical Radiography*, 1993.)

Potential benefits must outweigh risks in exposing individuals to ionizing radiation.

**New Precedents, in General, Require Thorough Public Examination**

Sierra Club is concerned about new precedents because they introduce unexamined safety issues. New precedents require vigorous and thorough public comments and debate.

In order to protect the public and the environment, the entire situation introducing a new precedent, usually as a proposal, requires full public debate including about the methods and extent of the full testing requiring of all technology. Vigorous tests are required of transport storage casks as well as of the complete physical characteristics of all potential route terrain.

No system of safeguards has been devised that is sufficiently reliable to prevent unsafe occurrences (SC BOD HLRW Policy Adopted May 6-7, 1978).

Weaknesses include containment unreliability from inadequate and incomplete testing, accident(s), human error(s), technology failure(s), unaddressed route characteristics, extreme weather, and potential terrorist interference. This is not a comprehensive list.

Of particular concern is the inadequate testing methodology used to approve the transport storage casks. The transport casks should be thoroughly tested for all potential route characteristics and for all extreme weather circumstances to the point of destruction in order to scientifically identify the cask strength, particularly in terms of the range of characteristics of the various radioactive waste contents.

**Transport, in General, Is Unnecessary**

The Sierra Club’s national Board of Directors has long been concerned that transportation may be merely a change in location of the waste that introduces unnecessary safety risks (SC BOD adopted HLRW Policy May 6-7, 1978).

**Maintenance of Environmental Integrity Necessary**

In order to maintain environmental integrity, Sierra Club is concerned about the introduction of new precedents and about applying adequate scrutiny, testing, and assessments to new changes with unexamined criteria.
Transporting high level liquid radioactive wastes from Chalk River, Canada, by bridge above the Great Lakes and the St. Lawrence River and near shore would likely constitute new precedents that require close scrutiny with transparent and thorough reviews. Such reviews include Environmental Impact Statement (EIS) in the USA, Full Environmental Assessment (EA) in Canada, and assessments that may be required by First Nations and other indigenous nations that likely would be impacted. Identification of all concerns through vigorous scientific examination, testing, and debate, including any previous issues with unaddressed inadequacies as well as any new precedents is critical for safety. Such environmental impact queries and assessments, in general, should address fully protecting the entire systems of ecosystems in the Great Lakes and the St. Lawrence River as well as the entire environment of all the parts.

The goal should address the maintenance and/or improvement of its chemical, physical, and biological integrity for multi-generations into the future, preventing environmental threats before they turn into an actual problem, and protecting the primary source of quality drinking water for the diverse communities of the Great Lakes and the St. Lawrence River in order to satisfy the IJC’s purpose as codified (GLWQA).

**Best Management Practices Necessary**

A best management practices’ approach based on the entire ecosystem approach of all the parts taken together is required, starting with the precautionary principle warranted by the actual persistent, bio-accumulative, and multigenerational threat of radioactive contamination.

Fukushima and Chernobyl have proven that serious accidents occur and destroy the biological integrity of large areas of the earth required for the very survival of humanity and other living organisms. Obviously, these catastrophes failed to protect the public, after assuring safety. Rational behavior now requires that we behave with more caution toward nuclear safety issues.

The Great Lakes constitute a unique and irreplaceable national and global treasure. The Great Lakes contain the drinking water required for the survival of 40-million people within its connected watersheds. Humanity simply cannot afford to make an error in judgment or to set in place the potential to fulfill an accident on such a grand level that would become an actual possibility with radioactive transportation by bridge and near shore of the Great Lakes and the St. Lawrence River. This warrants the unacceptable risk category.

The Sierra Club advocates appropriate measures to provide protection for public health and safety through best management practices. Best Management Practices are developed from full environmental queries, tests, and assessments. Appropriate regulation and control of all shipments of radioactive waste, whether of military or non-military origin, is necessary.

**Legal and Regulatory Compliance and Enforcement Involves Many Nations and Governmental Entities**

The Sierra Club also supports (sub-federal) efforts to provide greater protection in the transportation of radioactive waste and commercial radioactive materials (SC BOD adopted Nuclear Power Policy February 2-3, 1980).

The Sierra Club advocates compliance with compact, federal, and state guidelines and regulations that should be facilitated by the enactment of strong, clearly defined penalties and disincentives for compliance failure, by generators, processors, transporters, and by radioactive waste storage and isolation facility builders and operators (SC BOD Adopted LLRW Policy March 16-17, 1991).

The Sierra Club’s John Muir Chapter recognizes that First Nations and other indigenous nations, particularly tribes on reservations within Wisconsin’s perimeter, maintain treaty rights and/or other rights to legal standing that may permit them to propose guidelines, regulations, penalties, and disincentives in order to maintain their quality of life and culture from degradation by other entities. Among these are sovereign treaty rights that include hunting, fishing, and gathering rights.
The Sierra Club’s John Muir Chapter acknowledges the rights of all peoples which have been fully acknowledged by the United Nations, such as the right to clean drinking water, among others.

**Application of Safety Protection Standards Must Protect the Public**

Safety protection standards must be fairly applied for all peoples. Distortions caused by subjectivity have been introduced into superficial claims and superficial treatment of safety protective goals that have not been adequately and completely explored. These distortions have introduced irrationality into the safety protection standards.

Scientific agreement exists that these safety protection standards should be conservative to protect the gene pool of humanity.

Superficial handling of the safety protection definition historically has created a dichotomy where the practice doesn’t match the intention of the safety protection definition. Unexamined and subjective assumptions have concluded that the worthwhile benefits exceeded those of the known harms to general population, causing an unfair leap concluding that these harms were acceptable. The specific failure has occurred with inadequacies of clearly identifying all the worthwhile benefits as well as all the potential harm in actual details.

Another second rational failure occurred when the potential harm lacked adequate close scrutiny about the fairness of this transaction of benefit for harm without its corresponding proper economic compensation of fair damages. In effect, the subjective interpretation of worthwhile benefits has distorted the fact that harm is being perpetrated onto an external population as unpaid externalities of doing business and making profits, particularly in the case of commercial nuclear waste. This uncompensated harm is not “acceptable” as has been erroneously assumed for decades. Those people whose qualify of life or lifespan has been sacrificed have not been properly compensated for unpaid externalities that are part of the cost of doing business. These externalities require being addressed within any industry, including the nuclear industry, in order to provide public protection and safety.

**Industry Liability**

Operators should assume liability by means of rebuttable presumption of law (SC BOD Adopted LLRW Policy March 16-17, 1991). [Look at policy and include all types of operators.]

In terms of financial liability issues, the Sierra Club advocates that a long-term liability fund, paid for by charges imposed on the generators, should compensate for personal injury and property damage in the event of leakage and provide the maximum third party liability insurance. During operation, cleanup, and decommissioning, the site operator should assume full liability through means of rebuttable presumption of law (SC BOD Adopted LLRW Policy March 16-17, 1991). [SC BOD probably adopted a repeal of Price-Anderson Act policy—incorporate here]

**Cradle to Grave Irrationality Requires Discontinuation of Radioactive Waste Production**

Unfortunately, we live under irrational governmental decision-making. In terms of the nuclear industries, these irrational times stem originally from the lack of scientific knowledge and technology to adequately and sufficiently deal with the radioactive waste problem at a harmless end point identifiable prior to generation of lethal waste. Continued irrationality is occurring because governmental decision-makers used a flawed assumption for approximately the last 70 years: they believed inaccurately that the nuclear waste solution so blindly desired would “definitely” appear over time, but that did not happen.

In retrospect, it was irrational to continue the creation of grave and lethal radioactive wastes without a specifically identified and known end-point where it would safely end.

This irrationality needs to stop with the discontinuation of radioactive waste production.
Until radioactive waste terminology is developed that accurately describes the characteristics of safety concerns, the inaccurate and incomplete radioactive waste terminology contributes to misleading perceptions, irrational leaps, and the failure to protect workers and the public from the complete variety of dangers present. As a result of inaccuracies and irrationalities applied in the past, the resulting guidelines and decisions contain elements lacking adequate safety measures.

The fact that radioactive leaks occur all over the nuclear industry proves that decisions made in the past that failed to protect the public were faulty and not protective of health, despite safety claims made at that time. Irrationally, we continue to use the decisions built upon such collapsing foundations. We need to improve and strive for excellence and perfection.

Sierra Club supports leaving all radioactive waste at its site of generation as best management practices unless a clear and serious danger exists that makes transport relatively a safer alternative with less adverse impacts. This includes both “low” and “high” level waste (SC BOD Adopted HLRW Policy May 2-3, 1987).

**Specific New Precedent: Liquid HEU Transport**

Of major concern in 2013 is a developing new transportation precedent: a secret transport of high level liquid bomb-grade uranium, referred to as Highly Enriched Uranium or HEU, is planned by armed convoy from the Chalk River, Canada, to Department of Energy’s (DOE’s) H-Canyon Savannah River Site (SRS), South Carolina.

Unlike solid waste, liquid waste would easily disperse into the environment in the situation when a serious accident occurs. Clean-up would be difficult, if not impossible. The resulting contamination would last for centuries.

**Unnecessary Transport, In Particular, is Unacceptable**

The Sierra Club’s John Muir Chapter opposes the unnecessary unsafe transportation of Canadian liquid HEU by truck over bridges and near shore of the Great Lakes and across more than 1000 miles to Department of Energy’s (DOE) H-Canyon site in South Carolina.

**Vigorous and Thorough Public Debate Required by All Impacted Nations for Liquid HEU Transport**

The unique properties of high level radioactive liquid waste introduce numerous new serious risks and threats. Liquid waste transport itself establishes a new precedent.

This new precedent status requires extensive public debate to avoid setting “the precedent” for a pattern to follow with unacceptable risky liquid transports that claim justification from this first transport. The “classified” and “secret” implications here strongly suggest to those protecting the Great Lakes that others with different agendas likely may try to avoid scrutiny unless the people and other governmental agencies speak up and take action. Safety and protection always requires public participation.

Full participation of the IJC, the States, the Provinces, the First Nations, other indigenous tribes, the non-governmental groups (NGOs), and other stakeholders is required. It is imperative that we cannot let this liquid radioactive waste transport avoid the safety discussions and debate that occurs only through a transparent and high level EIS process (USA) and Independent Panel Full EA process (Canada) where the details of containment, route, and timing are made public and sufficiently debated in public hearings.

Tom Clements with the Alliance for Nuclear Accountability, Columbia, South Carolina, requested that US DOE prepare a Supplemental EIS (SEIS) on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (DOE/EIS 0218, February 1996) because liquid transport was not addressed in the EIS regarding DOE’s SRS site.
Sierra Club’s John Muir Chapter, Wisconsin: Stop High Level Radioactive Waste Transport

DOE’s decision in its recent 2013 Supplemental Analysis to not conduct a SEIS leaves too many safety issues unaddressed. It is unacceptable to not do an EIS or SEIS under these circumstances. Assurances of adequate scientific testing of transport containment casks should be examined rationally along with the other critical details important to safety including risk assessments. Sierra Club’s John Muir Chapter urges that a new vigorous EIS is warranted for liquid HEU transport from Chalk River. Anything less would constitute failure to comply with the expressed mission to protect the Great Lakes from actual potential harm.

Details of the Liquid HEU Transport Proposal from Chalk River

The Sierra Club supports the highest level of environmental review by all relevant agencies in the USA, Canada, First Nations, and other indigenous nations in regard to this cross-border unprecedented shipment of high level liquid Highly Enriched Uranium (HEU) waste. The liquid form is the new precedent.

The liquid comes from Chalk River’s Fissile Solution Storage Tank (FISST). The FISST is controversial within the industry and a source of persistent unease within the industry.

The liquid requires extremely careful monitoring, mixing, and heating for temperature control in order to prevent it from a worst-case scenario which would potentially achieve a self-sustaining chain reaction of fissioning atoms, called criticality. Such a chain reaction could potentially rupture the container, release the liquid into the environment, and endanger living organisms and persons nearby. FISST reportedly contains an estimated 175 kilograms of HEU of 93% uranium 235, which is sufficient to construct 3 to 8 small nuclear weapons or Hiroshima-sized bombs. It also contains cesium 137, Iodine 129, and strontium 90 (Ian MacLeod, 2-10-2013). [Seeking closer source verification of HEU contents]

An estimated 40 to 50 shipments of liquid HEU (Gordon Edwards, President, Canadian Coalition for Nuclear Responsibility, ccnr@web.ca) would travel past communities in Canada and the USA, crossing numerous waterways, and likely the St. Lawrence River, or possibly Windsor or another location.

This liquid HEU radioactive waste sets a dangerous precedent that endangers the safety and protection of the public and the Great Lakes and the St. Lawrence River.

Canadians Are Without Plans for Public Debate

The Canadian Nuclear Safety Commission (CNSC) and the Atomic Energy of Canada, Ltd (the operator of Chalk River Laboratories where the HEU originates) claim Canadian federal law prohibits publicly releasing details about the mission, including the number of transport truck trips involved, the routing through Eastern Ontario, and the timing.

US NRC documents suggest many truck trips will be required and could begin as early as August 2013 and occur over the next year (Ian MacLeod, Ottawa Citizens, 2-10-2013 Liquid Bomb-Grade Uranium to be Shipped Secretly from Chalk River to U.S.). It appears these trips are being delayed.

USA Fast-Tracking Liquid HEU Transport

Liquid HEU shipments have not been subjected to the rigors of an EIS or an SEIS in the USA. NRC documents indicate these liquid HEU transports are being fast-tracked under a request for an “expedited” certification review. This request inappropriately uses stainless steel casks that are not sufficiently designed and tested for HEU liquid waste but rather were designed and not sufficiently tested for dry nuclear waste.

If NAC International Inc, USA, uses its NAC-LWT (Legal Weight Truck) cask system to transport the radioactive liquid on the more than 1000-mile trip, CNSC and other experts have stated this would be a new precedent (Ian MacLeod, 2-10-2013).
Safer Alternatives Exist
Other safer alternatives exist to handle this liquid weapons grade uranium on site in Canada. This HEU liquid waste has been routinely solidified and stored on site since 2003 without transport (Gordon Edwards). Another alternative could be to denature it to make it no longer weapons usable, which would not require transport. Since alternatives are relatively less dangerous and less expensive, this becomes an indicator that a political agenda is in operation, rather than best scientific practices and rather than any dire need to transport. By shipping the HEU to South Carolina from Canada, it will help the US DOE keep its budget for H-Canyon open. We should not risk an irreplaceable national and global treasure for the US DOE’s political benefit.

Safer On-Site Interim Storage
The Sierra Club believes that pending the establishment of a permanent repository that interim storage can best be accomplished at the site of generation. The exception would be the presence of a clear and actual present danger, at which time high level nuclear waste should be transferred to a more stable reactor site (SC BOD Adopted HLNW Policy May 2-3, 1987). The Chalk River reactor is stable and does not require transport of its HUE waste.

Universal Human Rights Activates Sustainable Global Environmental Security Goal
The Sierra Club has resolved in terms of environmental security that a secure and sustainable global environment is an intrinsic part of universal human rights and is indispensable to a secure society. The security of that right and of all nations depends on environmentally sustainable economic, cultural, and political structures and policies (SC BOD Adopted Environmental Security Policy Sept 15-16, 1990, Amended Nov. 21, 2002).
In this regard, the Sierra Club’s John Muir Chapter recognizes these rights are particularly applicable to the US, Canada, First Nations, and other indigenous nations. The Sierra Club’s John Muir Chapter has a long-standing working relationship with various indigenous tribes within the State of Wisconsin’s perimeter that recognizes indigenous treaty rights. The John Muir Chapter has worked with various tribes within Wisconsin to protect endangered species, watersheds, and the integrity of the environment from proposed activities that would pollute and seriously damage the quality of life for tribal members and other Wisconsinites.
In addition, the courts have historically recognized and upheld indigenous tribal treaty rights in the State of Wisconsin. The John Muir Chapter also supports the rights of all peoples that have been fully acknowledged by the United Nations, such as the basic right to clean drinking water as well as other rights.

DOE Mishandled NWPA and HLRW Program
The liquid HEU will be transported to the DOE facility H-Canyon in South Carolina. Attainment of fundamental safety and objectives is threatened due to deficiencies in the Nuclear Waste Policy Act of 1982 and its implementation by the US DOE (SC BOD Adopted HLRW Policy May 5, 1984). DOE has mishandled the HLRW Program with its inherent conflict of interest and has lost its public credibility (SC BOD Adopted HLNW Policy May 2-3, 1987).

Local and State Law Should Apply to Route Determination
Transportation hazards and distances should be considered and kept as low as possible.
Specific routes should minimize the possibility of human exposure in the event of an accident (including through drinking water) and should not override local and state ordinances and laws. Sierra Club further advocates the application of state and local statutes and ordinances to route selection.

Appropriately trained personnel and adequate emergency equipment should be provided along specified transport routes. Shipments should be monitored to assure acceptable external radiation levels (SC BOD Adopted HLRW Policy May 5, 1984).

**Independent Commission Needs to Investigate NWPA**

The Sierra Club opposes unnecessary transportation of high level radioactive waste. It wastes money. It exposes communities unnecessarily to potential health, environmental, and economic hazards should a breach of containment occur. The import site may become the de facto final, above ground repository, and possibly the preferred site for reprocessing the nation’s HLRW.

The Sierra Club recommends that the provisions and implementation of the Nuclear Waste Policy Act (NWPA) be investigated by a special independent commission and recommendations be made at the conclusion of that investigation to amend the NWPA. These should mandate the DOE, in the absence of adequate experience, to demonstrate by destructive testing to the limit, that components for transport and storage of HLRW are reliable and safe (SC BOD Adopted HLRW Policy May 2-3, 1987).

**Stop Government Subsidies to Commercial Nuclear Entities**

The Chalk River HEU waste comes from a Canadian facility that is marketed and that is commercial in nature.

In the absence of a viable, safe, permanent solution to the radioactive waste management problem, the proposal by the US federal government to centrally store spent nuclear fuel represents a federal subsidy to private industry and merely a change in location of waste.

**Stop Temporary Centralized Nuclear Waste Repositories**

The Sierra Club is concerned about the need for a timely, permanent resolution of this critical waste problem and opposes the establishment of temporary centralized spent nuclear repositories to which spent fuel is transferred, unless the establishment of such temporary repositories is an integral part of a viable safe permanent disposal system for such wastes. The potential for diversion or accidental breach of containment during transport to the repositories is part of the Sierra Club concern (SC BOD Adopted HLRW Policy May 6-7, 1978).

In summary, the Sierra Club’s John Muir Chapter of Wisconsin requests the IJC take action to stop all high level radioactive waste transport proposals and/or plans for transport over bridges and near shores of the Great Lakes and the St. Lawrence River and their tributaries. We also request the IJC take action to stop radioactive waste transport proposals that contain fission products anywhere within the waste regardless of the official term used to classify the waste as “low,” “intermediate,” or “high” level. This request also includes but is not limited to the unnecessary and precedent-setting dangerous proposal from the Canadian Nuclear Safety Commission (CNSC), the Atomic Energy of Canada Ltd, and the US Department of Energy (DOE) to ship high level radioactive HEU waste over 1000 miles from Canada to South Carolina crossing over the Great Lakes and the St. Lawrence River by bridge and over their tributaries numerous times. These dangerous proposals lack best scientific management practices and have much safer alternatives.
We also request the IJC Nuclear Task Force be re-established in order for the IJC to meet its purpose and mission to deal with all toxics which include radioactive waste and other radioactive pollution from multiple uses.

Thank you for the serious consideration that you give to this request.
Dear Honorable Commissioners:

We thank you for this opportunity to provide official testimony and official requests.

The Sierra Club’s John Muir Chapter of Wisconsin opposes all transportation of high level radioactive waste with fission products (regardless if it may be defined as low level, intermediate level, or high level by different agencies) on the Great Lakes and the St. Lawrence River as well as above it by bridge and near shore. The safety concerns and dangers have long been recognized as highly increased as soon as transport is introduced with radioactive waste. 

Worse yet, the design and testing of the transport storage casks have never been adequately and thoroughly tested until destruction. The testing of transport storage casks for long distance falls as well as weather extremes has been inadequate and lacks credibility in terms of thorough scientific inquiry. Transportation of high level radioactive waste is unnecessary when an alternative method exists on-site, which is usually the case except when a clear actual grave concern exists. Unnecessary transportation includes, but is not limited to, the precedent-setting proposals to ship by boat high level radioactive waste in the steam generator proposal from Bruce nuclear facilities in Canada to Sweden and in the proposal to truck over bridges and roads high level radioactive waste shipments of liquid Highly Enriched Uranium in nitric acid from Chalk River Laboratories in Canada to US Department of Energy’s H-Canyon facility in South Carolina. Precedent-setting proposals require intensive and thorough scientific scrutiny in order to avoid a potential large-scale catastrophe caused by human irrationality at the front-end.

No system of safeguards has been devised that is sufficiently reliable to prevent such occurrences (SC BOD HLRW Policy Adopted May 6-7, 1978). Weaknesses include containment unreliability from inadequate and incomplete testing, accident(s), human error(s), technology failure(s), extreme weather, and potential terrorist interference. This is not a comprehensive list. In particular concern is the inadequate testing methodology used to approve the transport storage casks. The transport casks should be tested for all potential route and extreme weather circumstances to the point of destruction in order to scientifically identify the cask strength in terms of the characteristics of the various radioactive waste contents. This includes

The Sierra Club’s national Board of Directors has long been concerned that transportation may be merely a change in location of the waste and introducing unnecessary safety risks (SC BOD adopted HLRW Policy May 6-7, 1978).
Shipping of radioactive wastes on or above or near shore of the Great Lakes and the St. Lawrence River would likely constitute new precedents that require close scrutiny with transparent and thorough review with Environmental Impact Statement (EIS) in the USA and Full Environmental Assessment (EA) in Canada as well as input from First Nations and other indigenous nations for expressing and identifying all concerns and particularly previously non-debated issues or unaddressed inadequacies as well as any new precedents. Such an environmental impact query and assessment should address fully protecting the entire systems of ecosystems in the Great Lakes and the St. Lawrence River as well as the entire environment of all the parts. The goal should be to maintaining its chemical, physical, and biological integrity for multi-generations into the future, preventing environmental threats before they turn into an actual problem, and protecting the primary source of quality drinking water for the diverse communities of the Great Lakes and the St. Lawrence River in order to satisfy the IJC’s purpose as codified (GLWQA).

A best management practices’ approach based on the entire ecosystem approach of all the parts taken together is required, starting with the precautionary principle warranted by the actual and multigenerational threat of radioactive contamination. Fukushima and Chernobyl have proven that serious accidents occur and destroy the biological integrity of large areas of the earth required for the very survival of humanity and other living organisms. The Great Lakes constitute a unique and irreplaceable national and global treasure. The Great Lakes contain the drinking water required for the survival of millions of people within its connected watersheds. Humanity simply cannot afford to make an error in judgment or to set in place the potential to fulfill an accident on such a grand level that would become an actual possibility with radioactive transportation on, above, or near shore of the Great Lakes and the St. Lawrence River. This warrants the unacceptable risk category.

The Sierra Club advocates the following measures to provide protection for public health and safety: federal legislation to require the Nuclear Regulatory Commission (NRC) to regulate and control of all shipments of radioactive waste, whether of military or non-military origin, with all commercial radioactive materials. The Sierra Club also supports (sub-federal) efforts to provide greater protection in the transportation of radioactive waste and commercial radioactive materials (SC BOD adopted Nuclear Power Policy February 2-3, 1980).

The Sierra Club advocates compliance with compact, federal, and state guidelines and regulations should be facilitated by the enactment of strong, clearly defined penalties and disincentives for compliance failure, by generators, processors, transporters, and by radioactive waste storage and isolation facility builders and operators. Operators should assume liability by means of rebuttable presumption of law (SC BOD Adopted LLRW Policy March 16-17, 1991).

In terms of financial liability issues, the Sierra Club advocates that a long-term liability fund, paid for by charges imposed on the generators, should compensate for personal injury and property damage in the event of leakage and provide the maximum third party liability insurance. During operation, cleanup, and decommissioning, the site operator should assume full liability through means of rebuttable presumption of law (SC BOD Adopted LLRW Policy March 16-17, 1991).

Unfortunately, we live under irrational governmental decision-making. In terms of the nuclear industries, these irrational times stem originally from the lack of scientific knowledge and technology to adequately and sufficiently deal with the radioactive waste problem at a harmless end point identifiable prior to generation of lethal waste. Continued irrationality is occurring because governmental decision-makers used a flawed assumption for approximately the last 70 years: they believed inaccurately that
the nuclear waste solution so blindly desired would “definitely” appear over time, but that did not happen. In retrospect, continuation of the creation of grave and lethal radioactive wastes without a specifically identified and known end-point where it would safely end was clearly irrational. Sierra Club supports leaving both low level and high level waste at its site of generation as best management practices unless a clear and serious danger exists that makes transport relatively a safer alternative with less adverse impacts (SC BOD Adopted HLRW Policy May 2-3, 1987).

Of major developing concern in 2013 is a developing new transportation precedent: a secret transport of high level liquid bomb-grade uranium, referred to as Highly Enriched Uranium or HEU, is planned by armed convoy from the Chalk River, Canada, to Department of Energy’s (DOE’s) H-Canyon Savannah River Site (SRS), South Carolina.

The Sierra Club’s John Muir Chapter opposes the unnecessary unsafe transportation of Canadian liquid HEU on, over, and near shore of the Great Lakes and across more than 1000 miles to Department of Energy’s (DOE) H-Canyon site in South Carolina.

The unique properties of liquid waste introduce numerous new serous risks and threats. Liquid waste itself establishes a new precedent that requires extensive public debate to avoid setting “the precedent” for a pattern to follow with unacceptable risky liquid transports that claim justification from this transport. The “classified” and “secret” implications here strongly suggest to those with the mission to protect the Great Lakes that the other decision-makers likely may try to avoid scrutiny unless pressured by the people and other governmental agencies, like the UC. It is imperative that we cannot let this transport avoid the safety discussions and debate that occurs only through a transparent and high level EIS process and Independent Panel EA process where the details of containment, route, and timing are made public and sufficiently debated in public hearings. Tom Clements with the Alliance for Nuclear Accountability, Columbia, South Carolina, requested that DOE prepare a Supplemental EIS (SEIS) on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (DOE/EIS 0218, February 1996) because liquid transport was not addressed regarding DOE’s SRS site. Assurances of adequate scientific testing of transport containment casks should be examined rationally along with the other critical details important to safety including risk assessments. Anything less would constitute failure to comply with the expressed mission to protect the Great Lakes from actual harm potential.

The Canadians, referring to the Canadian Nuclear Safety Commission (CNSC) and the Atomic Energy of Canada, Ltd (the operator of Chalk River Laboratories where the HEU originates), claim Canadian federal law prohibits publicly releasing details about the mission, including the number of transport truck trips involved, the routing through Eastern Ontario, and the timing. US NRC documents suggest many truck trips will be required and could begin in August 2013 and occur over the next year (Ian MacLeod, Ottawa Citizens, 2-10-2013 Liquid Bomb-Grade Uranium to be Shipped Secretly from Chalk River to U.S.).

The Sierra Club supports the highest level of environmental review by all relevant agencies in both Canada and the USA in regard to this cross-border shipment of unprecedented liquid high level Highly Enriched Uranium (HEU) waste. The liquid form is the new precedent. The liquid comes from Chalk River’s Fissile Solution Storage Tank (FISST) as it complies with those parameters. The FISST is a source of persistent unease within the industry as well as controversial within the industry. The liquid requires extremely careful monitoring, mixing, and heating for temperature control in order to prevent it from a worst-case scenario which would potentially achieve a self-sustaining chain reaction of fissioning atoms, called criticality. Such a chain reaction could potentially rupture the container, release the liquid into
the environment, and endanger living organisms and persons nearby. FISST contains an estimated 175 kilograms of HEU of 93% uranium 235, which is sufficient to construct 3 to 8 small nuclear weapons or Hiroshima-sized bombs. It also contains cesium 137, Iodine 129, and strontium 90 (Ian MacLeod, 2-10-2013).

Liquid HEU shipments have not been subjected to the rigors of an EIS. NRC documents indicate these liquid HEU transports are being fast-tracked under a request for an “expedited” certification review but this request uses stainless steel casks that are not sufficiently designed and tested for HEU liquid waste but rather were designed and not sufficiently tested for dry nuclear waste. If NAC International Inc, USA uses its NAC-LWT (Legal Weight Truck) cask system to transport the radioactive liquid on the more than 1000 mile trip, CNSC and other experts have stated this would be a new precedent (Ian MacLeod, 2-10-2013).

Shipping highly radioactive waste in liquid form over public roads near the Great Lakes or anywhere by itself is unwarranted. An estimated 40 to 50 shipments (Gordon Edwards, President, Canadian Coalition for Nuclear Responsibility, ccnr@web.ca) would travel past communities in Canada and the USA, crossing numerous waterways, and likely the St. Lawrence River, or possibly Windsor or another location. This liquid HEU radioactive waste sets a dangerous precedent that endangers the safety and protection of the public and the Great Lakes and the St. Lawrence River. Unlike solid waste, liquid waste would easily disperse into the environment in the situation when a serious accident occurs. Clean-up would be difficult, if not impossible. The resulting contamination would last for centuries.

Other safer alternatives exist to handle this liquid weapons grade uranium on site in Canada. This HEU liquid waste has been routinely solidified and stored on site since 2003 without transport (Gordon Edwards). Another alternative could be to denature it to make it no longer weapons usable, which would not require transport. Since alternatives are relatively less dangerous and less expensive, this becomes an indicator that a political agenda is in operation, rather than best scientific practices and rather than any dire need to transport. By shipping the HEU to South Carolina from Canada, it is fact that it will help the USA DOE keep its budget for H-Canyon open. We should not risk an irreplaceable national and global treasure for the USA DOE’s benefit.

The Sierra Club believes that pending the establishment of a permanent repository that interim storage can best be accomplished at the site of generation. The exception would be the presence of a clear and actual present danger, at which time high level nuclear waste should be transferred to a more stable reactor site (SC BOD Adopted HLNW Policy May 2-3, 1987).

The Sierra Club has resolved in terms of environmental security that a secure and sustainable global environment is an intrinsic part of universal human rights and is indispensable to a secure society. The security of that right and of all nations depends on environmentally sustainable economic, cultural, and political structures and policies (SC BOD Adopted Environmental Security Policy Sept 15-16, 1990, Amended Nov. 21, 2002).

The liquid HEU will be transported to the DOE facility H-Canyon in South Carolina. Attainment of fundamental safety and objectives is threatened due to deficiencies in the Nuclear Waste Policy Act of 1982 and its implementation by the US DOE (SC BOD Adopted HLRW Policy May 5, 1984). DOE has mishandled the HLRW Program with its inherent conflict of interest and lost its public credibility (SC BOD Adopted HLNW Policy May 2-3, 1987). Transportation hazards and distances should be considered and kept as low as possible. Specific routes shall minimize the possibility of human exposure in the event of
an accident (including through drinking water) and shall not override local and state ordinances and laws. Sierra Club further “urges specific congressional action which will permit state and local statutes and ordinances to apply to route selection.” Appropriately trained personnel and adequate emergency equipment should be provided along specified transport routes. Shipments should be monitored to assure acceptable external radiation levels (SC BOD Adopted HLRW Policy May 5, 1984).

The Sierra Club opposes unnecessary transportation of high level radioactive waste. It wastes money. It exposes communities unnecessarily to potential health, environmental, and economic hazards should there be a breach of containment. The import site may become the de facto final, above ground repository, and possibly the preferred site for reprocessing the nation’s HLRW. The Sierra Club recommends that the provisions and implementation of the Nuclear Waste Policy Act (NWPA) be investigated by a special commission and recommendations be made at the conclusion of that investigation to amend the NWPA. These should mandate the DOE, in the absence of adequate experience, to demonstrate by destructive testing to the limit, that components for transport and storage of HLRW are reliable and safe (SC BOD Adopted HLRW Policy May 2-3, 1987).

In the absence of a viable, safe, permanent solution to the radioactive waste management problem, the proposal by the federal government to centrally store spent nuclear fuel represents a federal subsidy to private industry and merely a change in location of waste. The Sierra Club is deeply concerned about the need for a timely, permanent resolution of this critical problem and opposes the establishment of temporary centralized spent nuclear repositories to which spent fuel is transferred, unless the establishment of such temporary repositories is an integral part of a viable safe permanent disposal system for such wastes. The potential for diversion or accidental breach of containment during transport to the repositories is part of the Sierra Club concern (SC BOD Adopted HLRW Policy May 6-7, 1978).

The Sierra Club’s John Muir Chapter also opposes the proposed shipment of steam generators containing high level radioactive waste inside of them from the Bruce nuclear facility in Canada through the Great Lakes and the St. Lawrence River to Sweden. If they sink with an adverse weather event or collision, a high possibility exists that the ability to retrieve the high level nuclear waste may be impossible.

The Sierra Club’s John Muir Chapter requests that the International Joint Commission on Great Lakes Quality re-establish its Nuclear Task Force. This action is warranted with the introduction of new unsafe and dangerous and unnecessary precedents being planned to unscientifically and carelessly ship dangerous radioactive cargo on the Great Lakes as well as over bridges that span the Great Lakes and its tributaries as well as alongside valuable shore-lands, upon which the health of the Great Lakes and its drinking water depends. These are proposed actions that were unimaginable when the IJC’s Nuclear Task Force was disbanded a few years ago.

In summary, the Sierra Club’s John Muir Chapter of Wisconsin requests the IJC to stop all high level radioactive waste transport planned to be shipped on the Great Lakes and the St. Lawrence River or planned to be trucked above it over bridges and planned to be trucked near its shores. This includes but is not limited to the unnecessary and precedent-setting dangerous proposal from Bruce nuclear facilities to ship radioactive steam generators on the Great Lakes and the St. Lawrence River to Sweden as well as the unnecessary and precedent-setting dangerous proposal from the Canadian Nuclear Safety Commission (CNSC), the Atomic Energy of Canada Ltd, and the US Department of Energy (DOE) to ship high level radioactive HEU waste over 1000 miles from Canada to South Carolina.
crossing over the Great Lakes and the St. Lawrence River by bridge and over their tributaries numerous times. These dangerous proposals lack best scientific management practices and have much safer alternatives. We also request the IJC Nuclear Task Force be re-established in order for the IJC to meet its purpose and mission to deal with all toxics which include radioactive waste.

Thank you for the serious consideration that you give to this request.
Dear Friend,
Please do not subject our roads to your radioactive waste. We have enough of the stuff without adding yours to it. Seriously, please do your best to come up with an intelligent program to handle your own radioactive waste. Thank you for your consideration.
Sincerely,
David Bear
Mesa, Arizona USA
To: The Canadian Nuclear Safety Commission (CNSC)

From: Ruth Thomas, Coordinator, Environmentalists Inc. (EI)


Date: February 9 2015

On February 12, 2013, members of Environmentalists Inc. (EI) learned of the secret plan to truck high-level radioactive liquid waste from Chalk River, Canada to the Savannah River Site in South Carolina. Since that time we have been seeking information about the proposal and how it compares to managing this waste at the Chalk River facility. During the past two years, EI has been keeping in touch with other resource organizations and their advisors, including nuclear scientists and nuclear engineers, in relation to this particular project. Organizations belonging to the Canadian Coalition for Nuclear Responsibility (CCNR) are among the groups we are working with.

We support CCNR’s comments of February 8, 2015 entitled "CNSC Technical Assessment Report: 'NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid.' On page 1 of CCNR’s comments, the Coalition’s president, Gordon Edwards, points out that "In the post-Fukushima era, we must plan for unanticipated events, even if the planners do not regard such events as credible. Such a risk assessment goes far beyond the technical specifications of the packaging; it cries out for public hearings on the entire project."

On the next page, Dr. Edwards identifies alternatives to the transporting of this highly radioactive liquid waste on the highways of Canada and the United States.

*First, he describes solidification of liquid waste containing weapons-grade uranium which has been taking place for the past ten years at the Chalk River site. Chalk River Laboratories has been relicensed to continue this solidification process.

*Downblending is another alternative to transport that can be done at Chalk River. This is a way to dilute HEU to LEU (low-enriched uranium), thereby making it no longer weapons usable and therefore reducing the security risks. Canada is experienced in downblending HEU.

We urge the Canadian Nuclear Safety Commission to manage highly enriched radioactive liquid waste at the site where it was generated. At the site, there are workers who are trained and experienced in both solidifying and downblending operations. The choice is very clear: the best interests of the people and the environment would be served by such a plan. It's just common sense to keep this dangerous material where it is.

Ruth Thomas
Environmentalists, Inc.
354 Woodland Dr,
Columbus, NC 28722
828-894-6305
Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa, Ontario, Canada K1P 5S9

Re: Transport of Highly Enriched Uranyl Nitrate Liquid (HEUNL)

Dear Commissioners and Staff,

CACC asks that you please refrain from transporting HEUNL.

There are many potential routes from Chalk River Laboratory to Savannah River Site. The potential threat of nuclear contamination in any of the places along any of those routes is unacceptable.

All the routes considered pass through one of the most densely populated areas on the face of the Earth. (See attached photo) Carrying this dangerous substance sets precedence for HEUNL shipments. If such shipments become regular occurrence. There will be an accident eventually.

A release of HEUNL into a river or stream would poison drinking water for potentially millions of people, causing deadly illness and birth defects.

The variables of the liquidity of the material and the watershed complexities of the terrain make any attempt to reroute and avoid populated areas irrelevant.

Highway accidents happen every day. Recently a 190 car pile-up near Kalamazoo, MI involved 76 semi-trucks. One truck was carrying formic acid, another was carrying fireworks. There was an explosion.

We implore you. The material at Chalk River Laboratory is safe where it is, safer than on the open road. CACC would politely ask that HEUNL liquid nuclear waste please not be transported.

Thank you for your time.

*The Future of the Earth Is In Our Hands*
Respectfully,
Wes Raymond
Administrator
Citizens for Alternatives to Chemical Contamination

The Future of the Earth Is In Our Hands
Potential routes for HEUNL shipments pass through one of the most densely populated areas on the face of the Earth. Any attempt to avoid population centers requires traversing more difficult terrain, and is irrelevant in light of watershed; Any area of low population in the Eastern US is upstream from areas of high population.
I oppose transport of radioactive waste across the hundreds of miles proposed!
Totally oppose! What are you thinking!

Regina Birchem, Ph.D.
Minneapolis, MN 55403
CNSC
SIR OR MS,
You have received many fine and precise comments from Resnikof, NIRS, Sierra Club, Gordon Edwards, Makijoni et al. I agree that the shipment is dangerous and I would like to join with the many commenters touting the dangers of this shipment.
I would further point out the problems specific to my location.
I live between I 95 and US 1. Several railroads are in the area parallel to these highways within spittin distance of my home. We have had several railroad fires due to the movement of oil and gas on these railways.
I am pleased that both fire and police now have field radiation meters. That will not stop accidents from happening, but might help handle the radioactive corpses from an accident?
If I am not making myself clear, I do not want radioactive wastes going thru my neighborhood.
Respectfully submitted,
Marvin Lewis
2152789963

Next Apple Sensation
1 little-known path to big profits
http://thirdpartyoffers.juno.com/TGL3141/54d94ec86c72e4ec81396st01vuc
Dear CNSC,

I am very much opposed to your plan to move liquid wastes to Savannah River facility. It is unsafe in so many ways, and has so many unthinkable consequences should something go wrong that it is clearly not worth the risks. Savannah River has enough spent fuel to work with to ensure a supply of plutonium virtually forever. This costly, hazardous, unnecessary project will only further endanger citizens, not make them any safer.

Respectfully yours,

Nick Thabit
Vermont, U.S.
From: Ace Hoffman
To: Consultation
Subject: URGENT Deadline today: Send a message by midnight to the CNSC - no radioactive liquid wastes on our roads.
Date: 9 février 2015 18:53:45

People are really upset about this... I suggest you not do it.

Ace Hoffman
Carlsbad, CA

------------------------------------------------------------------------------------------------------------------------------------

PLEASE WRITE A BRIEF LETTER AND PLEASE FORWARD TO ALL INTERESTED GROUPS:

cecile [pineda]

Begin forwarded message:

From: kay cumbow <kcumbow@greatlakes.net>
Date: February 9, 2015 3:02:30 PM PST
To: disarm@wilpfus.org
Subject: [Disarm] Send a message by midnight to the CNSC - no radioactive liquid wastes on our roads.

On 2/9/2015 5:14 PM, kay cumbow wrote:

Hi
Everyone,

If possible, please write a short note by midnight tonight, calling on the Canadian Nuclear Safety Commission (CNSC) to NOT ship these highly radioactive liquid wastes over our roads, and to do the right thing, and protect our communities and our watersheds (including the Great Lakes, which hold 90% of north America's fresh waters and provide drinking water for over 40 million people, important fisheries, also critical for agriculture and tourism) - by holding a full environmental review with a public hearing.

No matter which route they ship from Chalk River Canada (by the Quebec border) to the Savannah River Site in North Carolina, it sets precedence in the U.S and Canada for shipping highly radioactive liquid wastes, which have never been shipped on U.S. or Canadian public roads before. These are a proliferation risk, so could be targeted by terrorists. In the past many years, Canada has downblended these dangerous wastes and stored them onsite as a solid. Certainly, there is no good reason why they could not do that now, or investigate other alternatives.

There is more good information below on these most dangerous shipments.

Thanks!

Kay Cumbow To clarify: "From 1986-2003, this intensely radioactive liquid was stored in the Fissile Solution Storage Tank (FISST) at Chalk River. In 2003 this tank was nearly full, and was taken out of service. Since then, this radioactive liquid waste at Chalk River has been routinely solidified and stored on-site. Now the liquid contents of the FISST are to be trucked to the Savannah River site." Excerpt from BACKGROUNDER posted below.
Key Issues

- The shipment of highly radioactive liquid waste over public roads is unprecedented in North America. The casks to be used to ship the waste have never been used for liquid radioactive waste transport.
- These liquid radioactive wastes could be dispersed into the environment if a serious accident occurs. Cleaning it up would be very difficult, if not impossible. The resulting radioactive contamination could last for centuries.
- One or two-truck convoys, each carrying a single cask of about 256 litres of the FISST solution, and escorted by armed guards, would travel weekly from Chalk River to Savannah River during the summer months. The entire consignment -- about 40-50 shipments -- would take a year or more.
- There have been no environmental hearings or any other public forum to examine potential impacts of transporting this waste or to consider alternatives means to handle it, such as solidifying it and storing it on site, or denaturing the weapons-grade uranium so that it is no longer weapons usable.

http://radioactive-roads.weebly.com/heu-shipments.html9

Do you like your roads radioactive?
If not, comment by February 9th on an application for the transport of Highly Enriched Uranium in liquid form, from Chalk River, Ontario to Savannah River, South Carolina.

Atomic Energy Canada Limited (AECL) is planning to truck 23,000 litres of highly radioactive liquid waste from its Chalk River Laboratory (CRL) facility approximately 2000 kilometres (1,200 miles) to the U.S. Department of Energy (DOE) Savannah River Site (SRS) in South Carolina. The shipments could begin as early as the spring of 2015, if approved by regulators in both countries.

On December 23rd the Canadian Nuclear Safety Commission (CNSC) invited the public to comment on the technical assessment report on the package design for the transport of highly enriched uranyl nitrate liquid (HEUNL).

Comments must be received by the CNSC by midnight, February 9th, 2015. Comments can be sent to email consultation@cnsc-ccsn.gc.ca

The CNSC documents provide basic information about the proposed shipments of highly enriched uranium nitrate liquid (HEUNL) from Chalk River Ontario to the Savannah River National Laboratory in South Carolina, including:

- HEU is being "repatriated" under the Global Threat Reduction Initiative; broad international effort to consolidate HEU inventories, due to weapons proliferation concerns
- In March 2012, announced that Canada and U.S. would expand efforts to return HEU materials, including those in liquid form
- HEU is uranium that has a concentration of U-235 greater than 20 weight percent; the HEUNL material consists of a solution of highly enriched uranyl nitrate, various other nitrates and water
- NAC International has modified their shipment package for solid high level radioactive wastes to include inner containers for the liquid wastes
- Each of the four containers will carry 58.1 litres of HEUNL; the CNSC assessed heat load based on a heat generation rate of 0.05 W/L and assumed a bounding heat load of 12.88 W for the liquid content
- Each inner container will be 225 kilograms; the maximum weight of the NAC-LWT package, modified to include the inner containers filled with HEU, will be 22,415 kilograms
- The revised version of the already certified (for solid nuclear wastes) certificate application must be approved by the U.S. and Canada, then applications must be made for a transport licence and an export license.

The application under review is for an amendment to the transport package. The transport package was designed and has been used for solid radioactive, and must be amended if it is to be used for the transport of liquid waste. The package is being amended by adding four inner containers. According to the CNSC "the design of the inner containers is proprietary and can therefore not be shown". The Technical Assessment Report and the Environmental Assessment Information Report issued by the CNSC for public comment do not provide any information about the design or the materials or methods used to manufacture the added inner
containers.
Read more of this summary
Read the Technical Assessment Report

BACKGROUNDER
The liquid radioactive waste in question has resulted from almost two decades of using weapons-grade uranium in AECL™’s National Research Universal (NRU) reactor to produce radioactive isotopes. The liquid waste contains highly radioactive fission products such as cesium-137, iodine-129, and strontium-90. Such high-level waste is the most radioactive material to be found on Planet Earth. From 1986-2003, this intensely radioactive liquid was stored in the Fissile Solution Storage Tank (FISST) at Chalk River. In 2003 this tank was nearly full, and was taken out of service. Since then, this radioactive liquid waste at Chalk River has been routinely solidified and stored on-site. Now the liquid contents of the FISST are to be trucked to the Savannah River site

Summary
Shipping highly radioactive waste in liquid form over public roads is unwarranted. It sets a dangerous precedent, as it could legitimize future shipments of liquid radioactive wastes on a global scale. The plan to ship this waste must be halted and a public decision-making process instituted to deliberate on this matter, for the safety and protection of the public, and for the sake of international security.

Read the full backgrounder in PDF
Northwatch | Box 282. North Bay. P1B 8H2 | Tel 705 497 0373 | www.northwatch.org

Disarm mailing list
Disarm@wilpfus.org
http://wilpfus.org/mailman/listinfo/disarm_wilpfus.org
I am addressing this message to the Canadian Nuclear Safety Commission re: your invitation for public comment on the technical assessment report on the package design for the transport of highly enriched uranyl nitrate liquid.

- There have been no environmental hearings or any other public forum to examine potential impacts of transporting this waste or to consider alternatives means to handle it, such as solidifying it and storing it on site, or denaturing the weapons-grade uranium so that it is no longer weapons usable.

- The shipment of highly radioactive liquid waste over public roads is unprecedented in North America. The casks to be used to ship the waste have never been used for liquid radioactive waste transport.

- These liquid radioactive wastes could be dispersed into the environment if a serious accident occurs. Cleaning it up would be very difficult, if not impossible. The resulting radioactive contamination could last for centuries.

- One or two-truck convoys, each carrying a single cask of about 256 litres of the FISST solution, and escorted by armed guards, would travel weekly from Chalk River to Savannah River during the summer months. The entire consignment -- about 40-50 shipments -- would take a year or more.

- I call upon the Rights of Mother Earth whose Rights are recognized the world over and which demand that Her laws be respected. Keep the nuclear contamination sequestered from the biosphere.

- Thank you,

- Sincerely,

- Cecile Pineda
Author of Devil's Tango: How I Learned the Fukushima Step by Step available from Wingspress.com
Read My Blog at http://devilstangobook.blogspot.com/
Follow Me @DevilsTango
LIKE My Page on Facebook https://www.facebook.com/DevilsTango

EARTH IS FLAT - PIGS CAN FLY - NUCLEAR POWER IS SAFE

"Repeatedly expecting a sane response from those who are insane is an exercise in madness." - Paraphrasing Einstein

We Americans are locked in an asylum for the criminally insane with the criminally insane, and they are armed to the hilt. - Charles Sullivan

Let your struggle talk. — Iori Mochizuki, Fukushima Diary

This communication may be unlawfully collected and stored by the National Security Agency (NSA) in secret. The parties to this email do not consent to the retrieving or storing of this communication and any related metadata, as well as printing, copying, re-transmitting, disseminating, or otherwise using it. If you believe you have received this communication in error, please delete it immediately.
We do not want the safety of our citizens to be threatened by radioactive waste transported from Canada to South Carolina. Please keep your waste in Canada.

Kathleen Ferris
3210 E. Compton Rd.
Murfreesboro, TN 37130
THE PROVINCIAL COUNCIL OF WOMEN OF ONTARIO

Established 1923

February 9th, 2015

Sent via email to consultation@cnscc csn.gc.ca

Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa, Ontario, Canada K1P 5S9

Re: The Technical Assessment Report on the NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid (HEUNL)

Prepared by Gracia Janes, VP Environment, Provincial Council of Women of Ontario
905 468 2841 gracia.janes@bellnet.ca

Over-view and Recommendation

The Provincial Council of Women of Ontario (PCWO) takes this opportunity to comment on the Technical Assessment Report on the NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid (HEUNL) and the accompanying Environmental Assessment Report very seriously, as do many groups, knowledgeable scientists and individuals.

Therefore, in light of our review of the technical assessment and EA material, along with our knowledge that the imminent CNSC review of the Transport License application will be internal, PCWO urgently recommends, that in the interests of public and worker health and safety and strong environmental protections, which are the responsibility of CNSC, there should instead be an extensive environmental assessment of the whole project with an opportunity for public hearings.

The following comments reflect our PCWO involvement to date, concerns regarding the proposal and specific criticisms of the CNSC internal technical and environmental assessment review.
Background

In February 2013 the Provincial Council of Women of Ontario, (PCWO), expressed our concerns to the Hon. Peter Kent, former federal Minister of Environment and the Hon. Joe Oliver, former Minister of Natural Resources, regarding an Atomic Energy of Canada (AECL) plan to transport, by truck 23,000 Litres of very dangerous, high level, liquid radioactive waste, some of it highly enriched uranium (HEU,) from Chalk River near Ottawa close to 2,000 kilometers to Savannah River, South Carolina, for solidification, rather than solidifying it and leaving it in on-site at chalk River as planned earlier.

Our concerns at that time were, and remain, that:

- the trucks carrying these extremely long lasting highly radioactive liquid fission waste products would, for the first time, be traveling over public roads in North America and this would set a precedent.

- multiple trips will be made by these truck convoys over at least a 2 year period - crossing watercourses, passing by and through many towns and prime farmlands, and possibly Niagara’s precious fruit lands, as well as densely populated cities on both sides of the border, some abutting Lake Ontario.

- should there be a critical event and accidental release of the materials, whether it be by human error of planned malfeasance, the environment, public health, safety and wellbeing will be put at considerable risk, immediately and for many, many years to come.

- the trips will be top secret i.e. no one but those arranging the shipments will know the timing or the route for these highly dangerous radioactive wastes, even though those in local municipalities will be designated “first responders.”

- if there is an accidental (or deliberate) release of the radioactive liquid, it could ruin a city’s water supply, or if there were a fire, require fast action to protect children who might be exposed to radioactive iodine – 129, in order to protect their thyroid glands. Local municipalities will not know of the trips and do not have the training to handle such sudden dangerous accidents.

Accordingly, PCWO has reviewed the CNSC Technical Assessment Report on the NAC Inc. –LWT Package Design for transport of Highly Enriched Uranyl Nitrate Liquid (HEUNL), and the Environmental Assessment Information Report and find them lacking. Both the reports and the planned, completely internal, next step i.e. the Transport licence, are most worrisome and definitely non-precautionary, when one considers public and environmental damage that could be done should there be a ‘worst case’ scenario during one of these unprecedented, unnecessary, cross-border shipments.

Our comments are not highly technical, as we are not scientists, but rely on others, such as Dr. Gordon Edwards, and nuclear waste expert Marvin Resnikoff Ph.D., who we quote at times. However, our views reflect general public concerns with the dangers and their potential exacerbation because of the cursory nature of the internal CNSC review and process as follows:

- The assessments were made by CNSC staff outside the parameters of a full environmental assessment review which would have allowed public concerns and input, backed by independent scientists to be received, tested and an alternative method of following the Canada/US non-nuclear proliferation Treaty satisfied e.g. solidification and storage on-site at Chalk River, as planned by Atomic Energy of Canada (AECL) until a few years ago, or solidification and shipment to the US for storage.

- Much of the key information staff relied on in its review was “proprietary” e.g. according to the CNSC report “the design of the inner containers is proprietary and can therefore not be shown.” This is unacceptable if safety is paramount. As noted by Marvin Resnikoff in his February 9th, 2015 comments to CNSC “The exact shape of the four containers that fit in the NAC-LWT cavity and how each container is sealed is proprietary…the modeling of heat flow, including conduction is also not available. The regulatory agencies should examine this modeling in detail and allow the public to review NAC’s calculations.”

- While the US prohibition on the transport of ‘liquid’ nuclear waste from Canada into the US remains in place, the proponent, CNSC, the transport company NAC International and the US Nuclear Regulatory Commission (NRC), the latter having just approved the proposed design, appear to have tried to skirt this rule by hiding the true nature of the material, calling it “highly enriched uranyl nitrate liquid”, rather than highly enriched liquid uranium nitrate, and saying that the
“vast majority of the contents are water”. In reality, while the highly enriched uranyl nitrate liquid comprises 1% of the total weight of the solution, the accompanying 99% of the liquid contains a variety of highly radioactive products that are extremely long lasting. According to Dr. Gordon Edwards, this radiotoxic liquid waste contains numerous highly radioactive fission products such as cesium-137, iodine-129 and strontium-90, and it (the waste) is “commonly regarded as the most dangerous and intractable kind of radioactive waste.”

- The CNSC staff’s Technical Assessment Review (TAR) and EA fail to use “conservative” assessment assumptions, that should, as expressed by Chair Binder in the Pickering life-extension Environmental Assessment Hearing, include a “worst case scenario”.

- The assessment tests related to possible accident scenarios e.g. dropping the transport package from “9 meters onto an unyielding surface”, or “1 meter onto a punch bar”, were conducted for solid nuclear waste, as per the original designed package, not the very different highly radioactive liquid nuclear waste of the amended application.

As noted by Gordon Edwards, in CCNR’s comments to CNSC, these tests seem “to provide no scientific justification for approving a modified package for transporting liquid HEUNL”. For PCWO, they clearly avoid having to deal with obvious potential dangers, and worse still, a “worst case scenario.” PCWO draws attention to the need for realistic assessments of risk of e.g. for fire, and notes the comments from Marvin Resnikoff, that although the regulatory fire accident standard used by CNSC is 800 degrees C, “a fire of 1010 degrees C is the temperature of burning fuel and is therefore closer to a realistic figure: the regulatory fire of 800 degrees C is the temperature of a house fire. CNSC and NAC are not claiming that the HEUNL cask could survive a real fire, just that the cask meets inadequate regulatory standards.”

- PCWO notes that the CNSC has confirmed in its reviews and reports that criticality is a safety concern — the highly enriched uranium is able to sustain a nuclear chain reaction but concluded that even accident conditions do “not raise criticality

- CNSC also acknowledged that even under “normal” (no accident) conditions residents along the route and drivers and passengers sharing the road with the
HEUNL shipments will receive a radioactive dose; the CNSC argues that the exposure rates will be below regulatory limits.

**Conclusion**

Given all these concerns, and those raised by many other groups, scientists and individuals, PCWO concludes by reminding CNSC that its mandate is to protect the health and safety of Canadians, and the environment in which we live, now and for future generations.

We consider these CNSC staff reports abysmally inadequate in this regard and would respectfully request that CNSC conduct an extensive environmental assessment of the whole project with full public input and attention to alternatives to satisfying the Canada/US non-nuclear proliferation Treaty e.g. solidification and storage on-site at Chalk River, as planned by Atomic Energy of Canada (AECL) until a few years ago, or solidification and shipment to the US for storage.
February 9, 2015

Sent via email to consultation@cnsc-ccsn.gc.ca

Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa, Ontario, Canada K1P 5S9

Re: The Technical Assessment Report on the NAC-LWT Package Design for Transport of Highly Enriched Uranyl Nitrate Liquid (HEUNL)

Dear Commissioners and Staff,

The necessity of a comprehensive and careful review was dictated by the extraordinary difference between the requirements for transport of highly radioactive solid material and this unprecedented plan to transport highly radioactive LIQUID. Unfortunately, such a review has not yet been done. Rather than a comprehensive environmental review, there was only a limited review of the package design. We are asking that this NAC-LWT package not be certified unless there is far more public information and review, including a comprehensive environmental impact statement.

The entire project, involving the transport of Highly Enriched Uranium (Uranium) Nitrate (HEUNL) and other highly radioactive liquid materials, represents the potential for serious and even catastrophic consequences. The public in two countries is very concerned about this matter. However, the transfer or repatriation of liquid HEU back to the United States has been planned so as to limit the scope of the review undertaken by relevant agencies in the US and in Canada to the package design only. Yet the public is very concerned about the actual packaging, inspections and care that will be taken in the transport and ultimate disposition of this material. We are concerned about failures in safeguards, overlooked considerations, untrained personnel, or personnel unable to deal with the environmental consequences and need for rapid clean-up of adverse outcomes.
Unfortunately, few of our concerns are addressed in the review of the package design. Given the large number of proprietary claims, it becomes impossible to determine the adequacy of the Agency review. The Canadian Nuclear Safety Commission (CNSC) has also reserved the transport issues for the next stage of review, when all information is prohibited from being available to the public. But the public has legitimate reasons for concern, given the absence of a comprehensive environmental impact statement and the large number of proprietary or confidential claims by the applicant. We have attached to this letter a list of essential information that was identified as proprietary in the US Nuclear Regulatory Commission Report (USNRC) safety evaluation report. How can the public meaningfully comment on a technical and potentially dangerous or harmful activity when little information is provided? This is the kind of situation in which we want to be able to trust, but also verify.

**No analysis of alternatives was undertaken**

The agreement to repatriate HEU was pursued with no examination of alternatives that might involve treatment of the material on-site at Chalk River, rather than the extraordinary and unprecedented shipment of highly radioactive LIQUID material. The exact nature of this highly radioactive liquid shipment, which poses significant health and environmental hazards different from an HEU shipment alone, should have been studied in a comprehensive environmental impact statement.

The actual need for repatriation of this material from Canada is baseless given that Canada has already been treating this material by mixing it with concrete and storing it. The radioactive liquid could also be down-blended. The change in the processing for this material and its rationale has not been documented, except to say that the US and Canada have agreed to repatriation of the uranium — although it is now a far different material than what was delivered to Canada to begin with.

A full environmental impact statement should have examined all the possible alternatives to shipments that pose an unusual hazard to the public and the environment on the long route to the Savannah River site in the US. This route crosses numerous water bodies and travels through populated areas. Instead of a full EIS, the environmental assessment was limited to package design only. This limited scope has allowed both the US and Canadian governments to ignore next steps as well as the ultimate disposition of this material.

The NAC-LWT casks are now limited to 15 months’ use for this purpose by the US NRC. What happens when the casks reach Savannah River if the material cannot be handled and processed immediately? Will the shipment casks be used to store the material? What are the implications of storage, given that there appears to be limitations of 15 months on the time these casks can be utilized? Based on limited information we
have obtained, we believe this restriction may be related to the potential for combustible gas generation to pose a problem.

Savannah River is already storing transuranic material that was supposed to be sent to the WIPP facility in New Mexico. (Of course the WIPP accident was one that was not supposed to happen, but the facility is shut down now, with no estimate of when it might be available again.) In the absence of a complete review of the entire project, the public does not even know whether this project, as planned, is technically feasible, much less understand the potential for environmental and health impacts.

**Transport plan is prohibited from availability to the public**

An application for actual transport has not been received, thus the review did not encompass transport or the environmental and safety considerations. Once the application is received, the public will not have access to the information since the transport plan is “prescribed” [sic] according to CNSC. (We think the Technical Assessment Report means to use the word “proscribed.”)

As a result, the CNSC alone “will ensure that the applicant has in place:

- adequate provisions to ensure that radiation doses to workers and the public will not exceed CNSC regulatory limits, and will be kept as low as reasonably achievable (ALARA) during the entire transport operation
- adequate provisions to protect the environment during the entire transport operation
- a transport security plan that has been submitted by the applicant and approved by the CNSC
- an emergency response assistance plan that has been submitted by the applicant and approved by Transport Canada”. (Technical Assessment Report)

Publicly available information in the US and in Canada about the entire project has been severely and unacceptably constrained, especially given the potential for disastrous consequences. Instead, we have received little to no information about key safety issues, and have been given patronizing assurances that are not at all reassuring. For example, “Shipments would follow the same stringent transportation and security requirements as the transport of HEU fuel bundles.” (at CNSC webpage pertaining to this matter)

*It is precisely the extraordinary difference between requirements for transport of highly radioactive solid material and this unprecedented plan to transport highly radioactive LIQUID that demands a very careful and extensive review.*
We support the comments of Gordon Edwards, Ph.D. of the Canadian Coalition for Nuclear Responsibility (CCNR) that it is deceptive to describe the contents of the shipments as HEUNL, when HEU represents less than 1% of the total weight percent of the solution. (p. 8 of the Technical Assessment Report). Based on his analysis of Table 2 at p. 9 the radioactivity of the gamma isotopes and their daughter products is $3.4 \times 10^{11}$ Becquerel’s per liter, which is 11,000 times more radioactive than all the uranium isotopes combined. This also misses many alpha emitters and all of the beta emitters. Public health and the environment require more comprehensive assessment of the potential doses this shipment represents for public exposure. We also note that all radionuclides in the liquid mixture are required to be documented in the Certificate of Compliance and in any transport papers that accompany the shipment, not solely the HEUNL content.

**CNSC’s conservative assumptions regarding an accident or spill**

The technical assessment report claimed to be conservative in assessing an accident and effects on the environment. Conservative assessment requires the assumption of reasonable worst-case scenarios.

It is **NOT conservative** to use an established requirement in regulation to assess the outcome of an accident or spill. Thus a release of 33/1000 of 1% of the HEUNL contents seriously underestimates the likely quantity of a spill under accident conditions. It is also not clear whether the actual contents and all the radionuclides were included in assessing potential exposures following a spill. As Dr. Edwards of CCNR pointed out even counting only external exposure and not internal exposure to a spill of 100% of the contents would provide a lethal dose.

It is also **not** conservative or scientific to assume that the answer to pollution is dilution. We thought such a concept had been completely discredited years ago. The dilution of a spill will not be possible in smaller bodies of water used as drinking water sources. Internal doses of radiation through ingestion or inhalation of alpha particles are particularly hazardous to the public that is exposed. The CNSC analysis did not evaluate internal doses.

The Environmental Assessment fails to even consider the likely exposures to various emergency responders, who may arrive at an accident with limited or no training in handling radiological incidents. Given the large quantity of radiation involved — 2,300 curies in a readily dispersible liquid form — it is essential to carefully evaluate the danger to these workers and to plan for their personal protection. Emergency responders could receive a lethal dose in a very short time period.

The Canadian Nuclear Safety Commission could have required that the transport application and all relevant plans be submitted at the same time as the package design.
Instead it appears based on statements made in the technical assessment report that CNSC is reaching a conclusion about the safety of this entire project in the absence of essential facts.

**Technical concerns related to package design and the review**

NAC requested a revision to its already existing certificate of compliance for the NAC-LWT package. The revision involved the addition of HEUNL — highly enriched uranyl nitrate liquid in inner containers — packed into the NAC-LWT package. In fact, the liquid contents contain far more than HEUNL — they contain an assortment of radionuclides. CNSC informed us that they utilize International Atomic Energy Agency (IAEA) transport standards.

The NAC-LWT package was previously authorized for spent fuel rods and assemblies, which are solid material. The USNRC’s rationale for ignoring the other radionuclides in the mixture with HEU is that the same radionuclides are found in spent fuel — and so were previously authorized. Therefore, according to USNRC, only the HEUNL needed listing as a revision.

However, the original package design did not authorize LIQUID radioactive material at all, so under IAEA regulations, all of the radionuclides in the liquid mixture must be listed in the certification. The package shall not contain contents in a form or physical or chemical state that is different from that which is authorized.

**IAEA 2009 Standards**

431.A *Type B(U)* package shall not contain:

(a) Activities greater than those authorized for the *package design*; (b) Radionuclides different from those authorized for the *package design*; or (c) Contents in a form or a physical or chemical state different from those authorized for the *package design*;

432.A *Type B(M)* package shall not contain: (a) Activities greater than those authorized for the *package design*; (b) Radionuclides different from those authorized for the *package design*; or (c) Contents in a form or a physical or chemical state different from those authorized for the *package design*, as specified in the certificate of approval.

IAEA 2009 regulations mention liquid radioactive materials in relation to Type A packages only. The requirements include either double containment or sufficient absorbent material to absorb twice the volume of the liquid, which in this case would be 128 gallons. USNRC only evaluated the containment boundary for the entire NAC-LWT package, not the HEUNL containers. This means they are not part of the containment system.

648.A *Type A package* designed to contain liquid radioactive material shall, in addition:
(i) Be provided with sufficient absorbent material to absorb twice the volume of the liquid contents. Such absorbent material must be suitably positioned so as to contact the liquid in the event of leakage; or

(ii) Be provided with a containment system composed of primary inner and secondary outer containment components designed to enclose the liquid contents completely and to ensure their retention within the secondary outer containment components, even if the primary inner components leak. (a) Be adequate to meet the conditions specified in para. 646(a) if the package is subjected to the tests specified in para. 725. (b) Either:

(i) Be provided with sufficient absorbent material to absorb twice the volume of the liquid contents. Such absorbent material must be suitably positioned so as to contact the liquid in the event of leakage; or

(ii) Be provided with a containment system composed of primary inner and secondary outer containment components designed to enclose the liquid contents completely and to ensure their retention within the secondary outer containment components, even if the primary inner components leak.

Additional requirements regarding leakage:

677. For a package in isolation, it shall be assumed that water can leak into or out of all void spaces of the package, including those within the containment system. However, if the design incorporates special features to prevent such leakage of water into or out of certain void spaces, even as a result of error, absence of leakage may be assumed in respect of those void spaces.

Special features shall include the following:

(i) Packages where, following the tests prescribed in para. 682(b), there is no physical contact between the valve and any other component of the packaging other than at its original point of attachment and where, in addition, following the test prescribed in para. 728, the valves remain leak tight; and (a) Multiple high standard water barriers, not less than two of which would remain watertight if the package were subject to the tests prescribed in para. 682(b), a high degree of quality control in the manufacture, maintenance and repair of packagings, and tests to demonstrate the closure of each package before each shipment;

We do not believe that there has been adequate evaluation of all the components that would prevent leakage from this package. Viton O-rings are being used as gaskets and these are unsuitable in radiation environments. See a large report on materials in O-rings http://www.newdealseals.com/catalogues/O-Rings.pdf At p. 53 there is a lengthy chart and Radiation, gamma is listed (alpha & beta are not listed). Viton (FKM) is given a rating of 4- unsuitable for gamma radiation. Viton is excellent for nitric acid but unsuitable for radiation.

613. The materials of the packaging and any components or structures shall be physically and chemically compatible with each other and with the radioactive contents. Account shall be taken of their behavior under irradiation. (IAEA 2009 standards)

We recommend extensive meetings explaining the transport plans and more opportunities for public comment. We would appreciate being kept informed of your
future decisions on this matter and the status of the project. For questions please call B. Warren at 845-754-7951.

Thank you for your attention.

Sincerely,

Barbara J. Warren, RN, MS
Executive Director
Citizens’ Environmental Coalition
Albany, NY

Roger Downs
Conservation Director
Sierra Club Atlantic Chapter
Albany, NY

Jessica Azulay
Project Director
Alliance for a Green Economy
Syracuse, NY

Mary Olson
Nuclear Information & resource Service
Takoma Park, MD

Tom Clements
Director
Savannah River Site Watch
Columbia, South Carolina

Wes Raymond
Administrator
Citizens for Alternatives to Chemical Contamination
Lake, Michigan
Attachment: Proprietary Claims Identified in USNRC Safety Evaluation Report

- Structural design
- Fill drain port
- Materials
- Maximum temperature under normal conditions and under accident scenario
- Maximum pressure under normal conditions and under accident scenario
- Minimum temperature under normal conditions
- Maximum normal operating pressure
- Maximum temperature and pressure under fire transient
- Containment design features
- Combustible gas generation
The CNSC's plan to ship highly dangerous liquid nuclear waste from Chalk River to Savannah South Carolina
It is not acceptable to the public. The potential for disaster is too great, with irreversible impact on innocent people and the environment far into the future. The Lac Megantic tragedy teaches us that unplanned accidents happen. It is only ethical to seek the best possible solution, such as solidifying the waste before transport. The full truth needs to be presented to the public, not simply a patronizing assurance that it is 'safe', and an open public enquiry held. Communities in Canada and the U.S. endangered by this proposal must be given a voice, and be the ones to decide.
Respectfully, Rev. Ruth MacLean
The CNSC's plan to transport highly dangerous nuclear waste from Chalk River to Savannah, South Carolina is not acceptable to the public. The potential for disaster is too great, with irreversible results that would impact innocent people and the environment far into the future.

The Lac Megantic tragedy teaches us that unplanned accidents happen. Surely there are alternatives, such as solidifying the liquid waste before transport. It is only ethical to seek the best and safest solution, rather than risk a tragedy. The full truth must be told to the public, not simply a patronizing assurance that it is 'safe', and an open public inquiry held. The communities in Canada and the U.S. which are endangered by this radioactive transport, must be given a voice, and be the ones who ultimately decide.

Respectfully, Rev. Ruth MacLean
Monday, February 9, 2015

Minister Greg Rickford  
Natural Resources Canada  
580 Booth Street, 21st Floor  
Ottawa ON  
K1A 0E4

Dear Minister Rickford:

Re: Package Design for the Transport of Highly Enriched Uranyl Nitrate Liquid (HEUNL)

Serpent River First Nation must oppose the Canadian Nuclear Safety Commission’s process of engagement regarding technical assessment report on the package design for the transport of highly enriched uranyl nitrate liquid (HEUNL) and the deadline for submissions as of February 9, 2015.

The shipping of radioactive materials is a very critical issue for First Nations across this country and in particular, treaty regions that have a very specific ‘constitutionality’ of rights. These rights will be infringed upon as a result of this call going forward without input from our First Nation. Environmental, social, political concerns are many from the Treaty First Nations perspective. In particular to this call, it describes shipping nuclear substances that are highly volatile and carcinogenic. To that end jurisdiction is the defined concern that we must raise with both the regulator, the Canadian Nuclear Safety Commission, as well as with the Federal Natural Resource Minister, Greg Rickford.

Given the jurisdictional implications on a number of fronts, the Canadian Nuclear Safety Commission should take a considerable amount more effort to ensure that wide spread education is afforded to those that do not even have an inkling that there is a call for input on such a critical subject. For certain, there is widespread opposition to the ‘invitation’ for comments regarding the ‘package design’ for the transportation of HEUNL because of the potential for setting a perception that First Nation communities endorse a certain level of standard of design. The reality – First Nations do not want these materials transported through their territories – period. The reason for this is merely the danger and the human and health impacts of these materials’ radiological influences.
Further, it remains to be clear with Canada that treaty regions are legitimate jurisdictions to be consulted and engaged as formal bodies with authority. This is troublesome because the nature and fundamental relationship that Canada has with First Nations, is largely based on treaties. This legal perspective cannot be denied and should not be sidestepped any further. From this standpoint, Serpent River First Nation must declare that treaty rights are being infringed upon by this very invitation for input regarding technical assessment report on the package design for the transport of highly enriched uranyl nitrate liquid (HEUNL). Treaty First Nations have obligations that are constitutional in nature; as well as under the United Nations Declarations on the Rights of Indigenous Peoples, of which Canada endorsed.

As a signatory First Nation to the Robinson Huron Treaty of 1850, Serpent River First Nation has the following specific assertions to register with Natural Resources Canada Minister and the Canadian Nuclear Safety Commission:

1) It is strikingly clear that despite the jurisdictional claim of the Indian Act, AANDC does not provide sufficient notification or takes any formal initiative to ensure these types of formal engagements are substantively accessible and forthright to First Nations. Simply, Canada does not serve its fiduciary duty regarding reserve lands and leaves critically important matters like this CNSC notification well under the radar – with NO response or notification from AANDC. Further to this absence of notification, it would stand to reason why Canada is not concerned with the notification of those that would be affected within their defined treaty regions – it cannot, it has no bearing on treaty outside of reserve lands. Treaties and the respective boundaries are catchments that require distinct accommodations – CNSC or NRCAN has not made this clear in any of its policies or regulations.

2) The human and environmental issues and impacts of radio active materials is not widely known due to the complex technical nature of the various grades of material, their compounds, exposure characteristics and half-life rates and parameters. It is this that becomes one of the biggest issues and concerns for Serpent River First Nation. We simply have had experience with the impacts of radioactive materials and waste in our territory from the Elliot Lake Mining Camp experience from the 1950’s-90’s. High rates of cancers, respiratory illness and abnormal skin conditions have raised legitimate concerns that radioactive exposure is in fact lethal.

3) Consultation and Accommodation is a legal obligation of the Crown and a right and a set of processes that are not linear or the same for every issue that requires engagement and decision. In this situation, it is being suggested that the call for input for the design of containers for the transportation of dangerous goods is sufficient enough accommodation for the approvals being sought by the proponent. The Canadian Nuclear Safety Commission must ensure that the efforts employed to provide input have been given sufficient effort so that all parties impacted will have a say. In this case, it can be argued that the effort to reach various catchments of groups is not sufficient. Natural Resources Canada must work in a cross ministerial manner to ensure that First Nations are notified and provided sufficient information on this critical engagement exercise. Capacity to respond to matters of engagement of this nature would lead one to believe that the proponent would ensure cost impacts and mitigation are considered to achieve the desired outcome – it stands to reason that these rights...
need substantive accommodation that have not been reconciled. CNSC must not proceed without ensuring that First Nations have the capacity to respond to this input.

The shortfalls is reconciling the legal duty to consult regarding technical assessment report on the package design for the transport of highly enriched uranyl nitrate liquid (HEUNL) is of grave concern to Serpent River First Nation. To remedy this, we are urging NRCAN and CNSC to consider the following:

1) Extend the timeframes for input pending new notification parameters for input;
2) That Natural Resources Canada and the Canadian Nuclear Safety Commission address this call for input to all Robinson Huron Treaty First Nations with the specific reference to the collective rights and interests of the treaty collective;
3) Resources for technical review be ascertained fairly and provided to ensure that every First Nation and the treaty collective are accommodated in being able to provide input to this call engagement effectively.

Please consider this a formal opposition to the CNSC deadline as of February 9, 2015, until such time that the above considerations have been discussed and reconciled through specific means considering the involvement of the First Nations, the Robinson Huron Treaty collective, the Canadian Nuclear Safety Commission and the Natural Resources Canada Ministry.

I look forward to your timely response.

Sincerely,

Chief Isadore Day, Wiindawtegowinini
Serpent River First Nation
Lake Huron Regional Grand Chief

c.c Canadian Nuclear Safety Commission
    Robinson Huron Chiefs / First Nations
    Chiefs of Ontario / First Nations
    Serpent River First Nation Council
    Serpent River First Nation Environmental Review Panel
    Ontario Environment Commissioner
    Ontario Premier and Cabinet
    MP-NDP Carol Hughes
    MPP-NDP Michael Mantha
Attention: Canadian Nuclear Safety Commission (CNSC)
Subject: HEUNL Technical Assessment

I just received an email this morning so I am writing to request the CNSC reject Atomic Energy Canada Limited (AECL) plan to truck 23,000 litres of extremely radioactive liquid waste (containing highly-enriched uranium) from its Ontario Chalk River facility to the U.S. Department of Energy’s Savannah River Site in South Carolina.

This radioactive waste could contaminate the environment if an accident occurred and cleaning it up would be nearly impossible. Radioactive contamination could persist for hundreds (or thousands) of years.

I want a proper public examination of the risks (and alternatives) before any AECL radioactive roadtrips are authorized. Until such a time, this radioactive waste should remain where it is now: in a secure container at Chalk River.

In this time of radical extremists committing acts of terrorism within our own borders, it is too dangerous to be exposing Canadians to this type of risk.

Sincerely,

Sherron Moorhead
Niagara-on-the-Lake, Ontario.
Attention: Canadian Nuclear Safety Commission (CNSC)

Subject: HEUNL Technical Assessment

February 9, 2015

We are writing today with a sense of urgency and requesting that CNSC reject Atomic Energy Canada Limited (AECL) plan to truck 23,000 litres of extremely radioactive liquid waste (containing highly-enriched uranium) from its Ontario Chalk River facility to the U.S. Department of Energy’s Savannah River Site in South Carolina.

We understand that this spring and summer 2015, trucks surrounded by armed guards and carrying thousands of litres of highly radioactive liquid waste containing highly-enriched uranium will be brought through Ontario, on major highways, to border crossings into the United States.

Please know that we find this transport, like the past plan to carry it on ships through the Great Lakes, highly unacceptable.

Damage to our environment in the case of any spill or accident could be catastrophic and cleaning it up would be next to impossible – affecting ecosystems, transportations systems, farm lands and more for generations to come.

Our party’s opposition to the shipping of this waste across the Great Lakes, through Canadian transportation systems and across international borders, still stands. This plan still does not address the severe threat to the Great Lakes ecosystems, and drinking water for millions of Canadians and Americans.

The federal NDP expects the CNSC to undertake a proper, thorough, and public examination of the risks, and exploration of alternatives to the transportation of radioactive waste through communities and vulnerable environments.

Yours truly,

Megan Leslie MP
Deputy Leader & Official Opposition Critic for Environment

Brian Masse MP