

New Clear Free Solutions



NB Power Licence Renewal Intervention

CNSC Hearing Notice No. 2017-H-02

Submitted by:
Chris Rouse
New Clear Free Solutions

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1.0 OVERVIEW

Please accept this intervention on the licence renewal for the Point Lepreau Generating Station from New Clear Free Solutions.

Our main concern is the 3 previously unknown earthquakes found near Lepreau during the paleo seismic hazard assessment. This assessment was part of the seismic hazard assessment the commission ordered in the 2011 licencing hearings. These earthquakes are larger than what was previously considered as credible. These are REAL earthquakes that have happened, and are no longer just a probability or assumption in a model. We would like to point out that these earthquakes were found to be several thousand years apart and given the timing of the last one another one during the life of Lepreau is most certainly credible. We would like to point out that Ken Burke the seismologist at the 2011 hearings has told the commission that the next significant earthquake would happen near were these earthquakes have been found.

We feel that REAL earthquakes should be given very serious consideration by the commission. One of the biggest lesson learned from Fukushima should be the need to protect the people from the faulty rational that allowed the licensee and regulator in Japan to dismiss the evidence of a REAL tsunami that they found happened in the past and they knew the plant could not withstand.

As a result of these three real earthquakes, the safety of Point Lepreau was re-assessed. The re-assessment found that large release seismic capacity from the previous PSA-Based SMA was over estimated at .42g and was now .35g. This is below the safety goal limit of .4g, and this has not been reported. The rational for this not being reported from NB Power is that they had requested that the CNSC Staff approve the change from .4g to .344g in their methodology and that the CNSC staff have accepted this new safety limit and therefore there is no safety limit exceeded.

It is very concerning that these new earthquakes have been found and NB Power and CNSC staff simply move the safety limit so it is no longer exceeded. This new safety limit is now the same as the core damage safety limit and now the plant has no defense in depth. We would like to remind the commission that the fundamental safety objective is to protect people and the environment from radiation not core damage accidents.

The safety goal limit of .4g was presented in the 2011 licence application by NB Power. The Commission in its reasons for decision also acknowledged the safety limits. The limit is part of the licencing basis and the CNSC staff cannot change them “downward”. There is provision for staff to increase the safety limit but not down. Once a safety limit is defined in the licencing basis it can only be changed by the commission in writing. Even if Staff could change the safety limit the commission should have been made aware of the change.

The main theme of our intervention is transparency. If safety limits are changed to make the plant safe we want it done transparently.

2.0 PSA SAFETY LIMITS AND TARGETS

2.1 Licencing Basis

The licensing basis for Point Lepreau is described in the very first license condition 1.1 which states:

“1.1 The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, as defined in CNSC document [INFO-0795: LICENSING BASIS OBJECTIVE AND DEFINITION](#), unless otherwise approved in writing by the Canadian Nuclear Safety Commission Tribunal (hereinafter “the Commission”) or a person authorized by the Commission.”

The definition from INFO-0795 states the following:

“2. Definition

The Licensing Basis for a regulated facility or activity is a set of requirements and documents comprising:

- (i) the regulatory requirements set out in the applicable laws and regulations*
- (ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence*
- (iii) the safety and control measures described in the licence application and the documents needed to support that licence application.”¹*

2.2 Applicable Laws

Canadian nuclear power plants are required to have safety goal limits and safety goal targets. The requirement for safety goal limits and targets are derived from Article 3, the purpose, of the Nuclear Safety and Control Act (NSCA), which states:

“3 The purpose of this Act is to provide for

(a) the limitation, to a reasonable level and in a manner that is consistent with Canada’s international obligations, of the risks to national security, the health and safety of persons and the environment that are associated with the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information; and

¹ http://nuclearsafety.gc.ca/pubs_catalogue/uploads/INFO_0795_E.pdf

(b) the implementation in Canada of measures to which Canada has agreed respecting international control of the development, production and use of nuclear energy, including the non-proliferation of nuclear weapons and nuclear explosive devices”

The requirement for limits is derived from the second word in the purpose “limitation”. Canada’s nuclear laws are unique in that they prescribe limits on risks. From our experience over the last 6 years it is apparent that CNSC staff and licensees would prefer that there be no limits put on Core Damage Risks and Large Release Risks. While they might like it to be this way, and have taken great steps to confuse the requirements around this area, it will take revisions to the NSCA to get rid of limits as a licensing requirement. As with most rules there are exceptions and the Commission could invoke Article 7 of the NSCA and give an exception to this requirement, but this must be transparently done.

The targets are defined within our international obligations, and specifically the Convention on Nuclear Safety.

“ARTICLE 6. EXISTING NUCLEAR INSTALLATIONS

Each Contracting Party shall take the appropriate steps to ensure that the safety of nuclear installations existing at the time the Convention enters into force for that Contracting Party is reviewed as soon as possible. When necessary in the context of this Convention, the Contracting Party shall ensure that all reasonably practicable improvements are made as a matter of urgency to upgrade the safety of the nuclear installation. If such upgrading cannot be achieved, plans should be implemented to shut down the nuclear installation as soon as practically possible. The timing of the shut-down may take into account the whole energy context and possible alternatives as well as the social, environmental and economic impact.”²

Point Lepreau is required to have PSA limits and targets regardless of what any regulatory document or licensee document may state, as this is a requirement of the NSCA. The limits need to be treated as risk based, and the targets treated as risk informed. Exceeding a limit requires regulatory action. This action is required to be reported to be transparent, but does not mean that the reactor needs to be shut down immediately or even if a license should be granted or not. It was suggested by CNSC staff that the whistleblower letter indicated that a license should not have been given because the 5 cases in presented. Examination of the letter would show that the whistleblower letter did not suggest this at all.

² <https://www.iaea.org/sites/default/files/infcirc449.pdf>

Exceeding a limit means that corrective actions must be undertaken to reduce the risk to a reasonable level. When targets are exceeded the licensee must do all practical upgrades to achieve a high level of nuclear safety. This can be risk informed, in that less priority can be given to a target that is just barely not met, but a result that is very close to the limit should be taken much more seriously and cost benefit can be used.

2.3 Licence Application

The current licencing basis is based on the 2011 NB Power licence applications which states following:

“Risk Indicators

Acceptance criteria for the PSA are presented below. The Level 1 limit and goal are presented as a frequency of occurrence, otherwise known as Severe Core Damage frequency (SCDF). The Level 2 limit and goal are presented as a frequency of occurrence, but in this case the term is Large Release Frequency (LRF). For the PSA-Based Seismic Margin Assessment, the limits for the Level 1 and Level 2 PSA are presented in terms of seismic capacity, referred to as the HCLPF (High Confidence Low Probability of Failure), with units of ‘g’ acceleration due to gravity.

For the Internal Events, Fire and Flood PSA, the results at Level 1 and Level 2 are compared to the values listed below. The limit represents a threshold whereby a combined result above the limit would constitute an unacceptable level of risk. The region between the limit and the goal is an area which is acceptable, but efforts are expected to be made to reduce the level of risk on a cost-benefit basis. Achieving a frequency below the goal represents a satisfactory level of risk. For the PSA-Based Seismic Margin Assessment, the limit corresponds to the Review Level Earthquake (RLE), and is a pass or fail threshold against which the resulting plant seismic capacity is compared. In this case, a HCLPF value higher than then the one listed below is satisfactory.

PSA LEVEL	INTERNAL EVENTS, FIRE AND FLOOD			PSA-BASED SEISMIC MARGIN ASSESSMENT	
	METRIC	LIMIT (Events/Year)	GOAL (Events/Year)	METRIC	LIMIT
LEVEL 1	Severe Core Damage	1E-04	1E-05	HCLPF	0.30g
LEVEL 2	Large Releases	1E-05	1E-06	HCLPF	0.40g

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³ E-DOCS-#3794617-v1-CMD_11-H12_1_Written_Submission_from_NB_Power_Nuclear_on_the_Application_for_the_Point_Lepreau_L

In the commissions reasons for decision for the 2011 licencing hearings they quote the large release safety goal of .4g from NB Power and also acknowledge it by indicating they are satisfied that PLNGS meets the required safety goals of .3g for core damage and .4g for large release.

“58. **NBPN** stated that the design basis of the PLNGS is a 0.2g8 earthquake. NBPN further stated the seismic margin assessment determined that there was a high confidence that core damage would be prevented in the event of an earthquake with horizontal ground acceleration as high as 0.3g, which would be expected to occur about once every 10,000 years. NBPN further stated that there is a high confidence that a large release of fission products from containment, estimated to occur less frequently than once every 100,000 years, would be prevented for an earthquake with a horizontal ground acceleration of as high as **0.4g**. NBPN noted that its assessment approximately corresponds to an earthquake with a magnitude of about 7 to 7.5 on the Richter scale located 30 to 35 km from the PLNGS site, which is not credible for the tectonic plate of New Brunswick. CNSC staff stated that it reviewed and accepted NBPN’s seismic margin assessment.

65. **Based on the above information, the Commission is satisfied that the PLNGS meets the required safety goals.** The Commission is satisfied that the seismic margin assessment has demonstrated with high confidence that core damage would be prevented in the event of an earthquake with horizontal ground acceleration as high as 0.3g, and that a large release of fission products from containment would be prevented for an earthquake with a horizontal ground acceleration of as high as **0.4g**. The Commission is satisfied that the safety systems currently in place would safely shut down the reactor in the event of the worst possible earthquake in the region. ”⁴

The large release safety limit of .4g is unquestionably part of the current licencing basis. The licencing basis can only be changed with the *approval in writing by the Canadian Nuclear Safety Commission Tribunal (hereinafter “the Commission”) or a person authorized by the Commission.* CNSC staff have not been authorized by the commission to change the safety goal limits once they have been defined in the licencing basis.

CNSC staff can make modification that increase the level of safety of the licencing basis⁵, but are not allowed to reduce the level of safety such as lowering a seismic safety goal limit from .4g to .344g. Even if the commission did authorize the staff to change the safety limit they would at a minimum had to informed the commission members of the change which staff have not done.

Until the commission approves in writing the change of the seismic safety goal from .4g downward to .344g the .4g shall apply to the NB Powers PROL. This means that PLNGS is currently operating with a safety limit exceeded, as the current assessment shows PLNGS only has a large release HCLPF of .35g. This is required to have been reported, and to our knowledge has not been done despite our request to NB Power to do so.

NB Power was made aware of three previously unknown earthquakes near PLNGS, that were not previously regarded as credible, and they simply just requested the CNSC staff to change the safety limit when it is not met. This change of LRF safety limit is not mentioned in either NB Powers CMD or CNSC staffs CMD, and the new .344g is presented by CNSC Staff as if it where always the limit. The change in limit is discussed on NB Powers PSA Summary provided on their website.

⁴ 2011-12-01-Decision-NBPower-e-Edocs3881211-Final

⁵ E-DOCS-_3791996-POINT LEPREAU LCH INFO-DOC GUIDE [NBPN][1]

We request that the commission not approve of the change in large release safety goal limit of .4g to .344g. We request that NB Power be ordered to provide upgrades until the .4g limit is met. At a minimum, we request that the commission approve in writing in its reasons for decision that they approve of the change from .4g to .344g. We ask the commission to do this with the knowledge of the three previously unknown earthquakes found during the paleo seismic study that they ordered. If the limit is changed it must be done transparently and by the commission members.

3.0 TRANSPARENCY

3.1 Seismic Hazard Assessments

To date the Probability Seismic Hazard Assessment (PSHA) and the Paleo Seismic Hazard assessments that the commission ordered NB Power to undergo and make the results public are still not available publicly and have not been tabled to the commission members who ordered the assessments. NB Power has given them to New Clear Free Solutions but we would like to point out that the original draft version we had to use the NB Right to Information Act to get a copy, even though it was Chris Rouse who had originally asked the commission to order the hazard assessment at the 2011 hearings.

We request that all the hazard assessments that have been completed be tabled for the commission member to review for the annual public meeting. We also request that these documents be posted on NB Powers website.

3.2 Participant Funding

PEACE-NB as the principal funding applicant and New Clear Free Solutions as co-applicant applied for participant funding to hire Dr. Robert Kennedy to perform a third-party review of NB Powers Seismic PSA and Seismic Margin Analysis as indicated below.

“We propose to have NB Powers Seismic PSA and Seismic Margin Analysis (SMA) be third party reviewed by Dr. Robert P. Kennedy from RPK Structural Mechanics Consulting in Oceanside California. This will include a review of the detailed seismic fragility and seismic margin and other documents that can be provided by the applicant. He will provide a written report to the commission that will identify any issues he may find or give confidence to the Commission, the applicant and public that this very important seismic work has been done correctly. He will be available for up to 3 days for the day 2 hearings in May where he can present his report and take questions from the Commission members.

Dr. Kennedy is one of the most prominent seismic engineers in the industry, and is quoted in or authored almost every seismic guide and publication including the ones used to perform the seismic PSA and SMA for Point Lepreau. The CNSC used his review services before in “RSP-0270 – Comments on existing AECL documents used in the seismic evaluation of the NRU facility and recommended acceptance criteria for a current evaluation of the seismic adequacy of the NRU facility” and “RSP-0255 – Independent review of staff review guides related to engineering aspects of protections against malevolent acts, seismic hazard, external hazards other than seismic, and internal hazards”.⁶

Sharon from PEACE-NB was awarded participant funding, but the portion for New Clear Free Solutions, which was to collect the documents needed, was not approved. We have asked both the CNSC and NB Power for the documents Dr. Kennedy needed for his third-party review in which we were not able to attain the documents needed for the review.

We were given reasons of security and third party confidentiality as reasons for not being able to receive the documents. We even stated that we did not want the documents ourselves and suggested that Dr. Kennedy sign a confidentiality agreement, but our requests were still denied. The only document that CNSC Staff and NB Power have available for Dr. Kennedy to review is the PSA summary written by NB Power on their website. In our original request to Dr. Kennedy to perform the third party review we sent a link to the summary provided by NB Power and his response to the summary is as follows:

“From: Robert Kennedy <bob@rpksstruct.com>

Sent: November 15, 2016 7:38 PM

To: 'Chris R'

Subject: RE: Seismic Third Party Review

Chris:

I have reviewed Section 6.4 of Point Lepreau Nuclear Generating Station Probabilistic Safety Assessment – Summary Report 0087-03610-002-001-001-PSA-A-01. Insufficient information is presented in this summary report to enable any meaningful review to be made. I would need detailed seismic fragility and seismic margin documents in order to perform a meaningful review. The cost for an adequate review plus attendance at three days of meetings in Saint John, New Brunswick would be \$30,000 CAD which is substantially more budget than you have available. If detailed seismic fragility and seismic margin documents can be made available to me, I am willing to donate up to 8 hours to review these documents to see whether a detailed third party review might be productive.

⁶ Participant Funding Application

Regards

Bob Kennedy

Robert P. Kennedy

RPK Structural Mechanics Consulting

7040 Dassia Way

Oceanside, CA 92056

760-295-8050

bob@rpkstruct.com

From: Chris R [mailto:Chris_R_31@hotmail.com]

Sent: Monday, November 14, 2016 3:42 PM

To: Bob Kennedy <bob@rpkstruct.com>

Subject: Seismic Third Party Review

Hi Mr. Kennedy

My name is Chris Rouse. You may remember me from 2012 when you reviewed a simplified hybrid seismic calculation performed by NB Power, the operators of the Point Lepreau nuclear generating station, for me and the charity that I was working at the time. Once again myself and many others are very appreciative of you doing that, and the professionalism that you demonstrated in your review. That review was integral to the regulator ordering NB Power to undergo an up to date seismic hazard assessment in 2012.

As part of that seismic hazard assessment NB Power had a paleoseismic study undertaken. The assessment found evidence of 3 historical earthquakes in the vicinity of Lepreau in the range of magnitude 6.5 to 7.0 since the last ice age. The final results of the seismic hazard assessment showed that an earthquake with a return period of 1 in 10,000 years was .58g. This is considerably higher than the .3g HCLPF core damage and .4g large release safety objective used in the previous PSA based SMA from 2008. As a result NB Power committed to redoing to the PSA based SMA and performing a full

seismic PSA, which they just release a summary of the results this Friday, which I have attached.

There are licencing hearings coming up in 2017 for Point Lepreau, and there is \$75,000 of participant funding available for public groups to hire expertise that will provide valuable information to the commission members. I would like to apply for some of this money to have you do a technical review of the seismic margin assessment and seismic PSA for the hearings. I think it would be reasonable to get \$15 to \$20 thousand (Canadian) of that fund for your expert review services, and possibly more. The review would include looking at the attached PSA summary and other documents relating to the seismic PSA and SMA, and generating a written report. Specifically we are concerned if proper methodology has been followed in the selection of the new safety objective (FIRS) and the results of the assessments. You would also be expected to come to Saint John New Brunswick for two or three days in May 2017 to attend the hearings and take questions from the commission members on your report.

Is this something that you would be interested in?

Regards

*Chris Rouse*⁷

PEACE NB and New Clear Free Solutions have no interest in wasting Dr. Kennedy's time and/or participant funding money. We feel it inappropriate to accept any money for a third-party review of a document that the expert has already stated has *insufficient information to enable any meaningful review*. As such Sharon from PEACE NB has informed the CNSC participant funding group that she does not wish to proceed with the funding agreement.

New Clear Free Solutions requests the commission obtain the services of Dr. Kennedy to perform the third-party review originally requested by PEACE NB and New Clear Free Solutions in our funding application. We request that he be given all the documents he needs to do the review, and we request to have him answer a list of questions that we provide to him. We request that his review be made public and we request that this review receive public written and oral comments at this year's annual public meeting.

⁷ Email Correspondence between Chris Rouse and Robert Kennedy

3.3 PSA Based SMA Methodology

One of the documents we requested from NB Power was the new PSA Based SMA methodology, in which we were not able to get. While the methodology for Gentilly II and the original 2008 Lepreau PSA Based SMA methodology have been released publicly by AECL/Candu Energy, we were denied this version. NB Power stated the following:

“Action #1 - Follow up if we could provide a copy of the new seismic methodology

Our follow up indicates that this is the intellectual property of CANDU. The releasable information on the seismic methodology is provided in the PSA section 6.4 and more specifically 6.4.4 of the public summary that is posted on the website. CANDU conducted a thorough review of the public PSA summary prior to publication.”⁸

It is the methodology where the CNSC staff are supposed to approve the definition of the safety goals. We strongly object to safety limits being defined in documents that are not accessible to the public. This is a licence renewal not a new licence, and therefore the CNSC staff do not get to change the safety limits as they have already been approved and form part of the licencing basis. This is not transparent or objective. Once the safety goals have already been approved by the CNSC staff and then defined in the licencing basis the power of the CNSC staff to approve a reduction in a safety goal limit is not within their powers. Once defined the limit can only be changed downward by written permission from the commission.

We would also like to complain that the above response came almost 1 week after the deadline for submissions. We were granted an extension but we did not inform NB Power that we received the extension. It seems they must have been notified through the cozy relationship they have with the CNSC staff.

We request that the methodology be made publicly available for public comments for the annual public meeting.

⁸ Email From Kathleen Duguay from NB Power

3.4 Letter to Minister Carr

On July 28, 2016, we submitted a letter to the Federal Department of Natural Resources Minister Jim Carr detailing 5 similar cases at Point Lepreau to the 5 cases presented in the alleged whistleblower letter. This letter has never been publicly discussed in front of the commission members. We are submitting this letter as Appendix A and is part of this submission.

The nature of the whistle blower letter and our letter to Minister Carr was about transparency and if the commission members are being given all the required information to make informed decisions. We are very concerned about the review of the whistleblower letter by Peter Elder. We challenge the commission members to re-read Mr Elders review and the whistleblower letter and look for evidence of Mr. Elders claims about the whistleblower letter in the actual letter. You will find Mr. Elder accuses the writers of doing things they did not do such as overstating the importance of the PSA which they did not do.

You will also find the record shows the CNSC staff very politely disagree with him at the public meeting on such things as the requirement of the inclusion of refurbishment configuration in the PSA. It is very concerning that Mr. Elder did not review the reporting requirements around the whistle-blower letter. The core concerns in the letter were not technical in nature but about transparency, reporting, and process.

New Clear Free Solutions requests that an independent outside audit be performed on the reporting requirements around the issues identified by the whistleblower letter and our letter to the Minister. We request that this audit be made public and discussed at the annual public meeting with written and oral comments.