

2017 February 15

Mr Brian Torrie
Director General, Regulatory Policy Directorate
Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa, Ontario, Canada K1P 5S9

Dear Mr Torrie,

Re: SNC-Lavalin Nuclear Comments on Discussion Paper DIS-16-05, Human Performance

SNC-Lavalin Nuclear (consisting of Candu Energy Inc and SNC-Lavalin Nuclear Inc.) appreciates the opportunity to provide comments on the CNSC Discussion Paper DIS-16-05, Human Performance. We agree with the CNSC position that a shared understanding of human performance and human factors is necessary.

SNC-Lavalin Nuclear is actively managing human performance, within our integrated management system, to support our safety culture program in our roles as:

- A licensee (with a Waste Nuclear Substance Licence),
- Provider of products and services to the nuclear industry, and
- Designer of nuclear power plants.

SNC-Lavalin Nuclear has reviewed the CNSC Discussion Paper DIS-16-05, Human Performance in consultation with Industry partners. In our discussions with Industry partners, it became apparent that more consultation and discussion with the CNSC is needed in order to achieve alignment on the definitions proposed by the CNSC in Discussion Paper DIS-16-05. Therefore, SNC-Lavalin Nuclear suggests that the CNSC hold a series of workshops with the licensees and other interested parties to foster achieving a shared understanding of human performance and human factors. In our view, the content workshop would benefit by taking into consider the materials used by WANO/INPO, IAEA and other established industry groups.

With respect to the questions posed by the CNSC in Discussion Paper DIS-16-05, please see Attachment A. SNC-Lavalin Nuclear has summarized our overall concerns regarding this document in the responses to the questions.

SNC-Lavalin Nuclear has implemented the INPO human performance materials for our workers in our licensed activities (e.g., HU generic, situation and knowledge worker tools). Our workers apply our human performance toolset as the need arises to manage risks in our licensed activities. In this sense, there is no compelling need to create the distinction of a “formal” program or otherwise, as asked in Q7 in DIS-16-05.





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SNC-Lavalin Nuclear remains committed to continually improving and fostering good human performance in support of a positive safety culture. If you require additional information, please contact Pamela Tume at 905-823-9040 ext 34179 or email at Pamela.tume@snclavalin.com.

Sincerely,

Albert Lee
Manager, Project Physics, Licensing and Safety
Nuclear
Power

Cc. R. Whalen
K. Verma
N. Badie
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N. Anghelidis

Attachment A

RESPONSES TO CNSC QUESTIONS – DIS-16-05 Human Performance

Q 1. Do you agree with the definition of human performance as stated above? Are there changes or alternative definitions you would propose?

SNC-Lavalin Nuclear shares the Industry’s concerns with the definition introduced in this discussion paper, which includes the phrase “results of human activities.” Since good results can sometimes be achieved through poor human performance practices, use of this phrase could in certain circumstances be viewed as promoting inappropriate (unsafe) behaviours to achieve a desired result.

A more accurate definition would recognize that human performance includes various factors that affect the behaviour of humans. It would also recognize the distinction between behaviours and their results (accomplishing a specific objective or task), which is not necessarily part of the human performance.

Hence, it is suggested the CNSC host a workshop with all interested parties to agree upon a clearly-written definition industry could align with based upon a common understanding and actual work in the field. Ahead of a workshop, licensees and the CNSC might consider the definitions used by WANO/INPO, IAEA and other established industry groups that use descriptors such as *series*, *variables* or *system*. For instance, the INPO definition says HU is a “series of behaviours executed to accomplish specific results.” The IAEA definition includes the phrase “variables that influence” while the American Department of Energy’s definition includes the phrase, “a series of behaviours.” FIT calls human performance “a system comprising People and the Work Environment.”

Q 2. Do you propose any changes or alternatives to the CNSC’s existing definition of human factors? Please provide rationale for any proposed changes or alternatives.

SNC-Lavalin Nuclear shares the Industry’s concerns that defining human factors as “those factors that influence human performance” can be overly broad and vague.

All aspects of a facility -- including its management system, social and economic conditions, physical design, as well as non-work related experiences and situations -- can influence human performance. The inherent characteristics of humans, the specific characteristics of individuals or groups of workers also influence work behaviours and results. Given this, the definition in this paper does not actually provide guidance because it can be interpreted as essentially everything about the facility, the worker and the environment around them. Considering these components are already included in other programs, licensee’s management systems and Licence Condition Handbooks, it is unclear why they would be replicated in a separate program. The definition and supporting references in this section are also circular. They define human factors in terms of human performance by giving examples of human factors that are then used as examples of elements of a human performance program later on, e.g. fitness for duty, organizational culture, etc.

SNC-Lavalin Nuclear suggests that the definition of human factors in CNSC P-119 be retained, i.e., “human factors” means factors that influence human performance as it relates to the safety of a nuclear facility or activity over all phases, including design, construction, commissioning, operation, maintenance and decommissioning.

Hence, it is suggested that the CNSC host a workshop with all interested parties to achieve consensus and alignment upon a definition of human factors that is based upon a common understanding and actual work in the nuclear facilities, and by extension related work in support of the nuclear facilities.

Q3. Do you agree with the objectives and practices of a human performance program listed above? Are there items that you would add to or remove from the lists? Please explain.

SNC-Lavalin Nuclear shares some of the Industry's concerns that the definitions of human factors and human performance in DIS-16-05 are not well aligned with the objectives and practices currently in use within nuclear facilities. The objectives, as stated in DIS-16-05, have not achieved the expectations of being specific, measurable, achievable, reasonable and time bound.

The practices listed for a human performance program are not all-inclusive and should only be provided as illustrative examples for guidance.

Also, the description of a human performance program as a set of coordinated activities, rather than as a system that is integrated into a program, not a program itself, would make it more amenable to be tailed in a graded approach for different types of nuclear facilities and licensed activities. Achieving excellence in human performance relies on a significant, over-riding leadership component and a significant planning phase to set workers up to succeed.

For reference ahead of a potential workshop, licensees and the CNSC might consider IAEA document **NG-T-2.7 Managing Human Performance to Improve Nuclear Facility Operation**, which supports the Re+ Md view saying, *"The strategic approach to improving human performance is really defined by two elements: (1) Anticipating, preventing, catching and recovering from errors on the job; (2) Identifying and eliminating organizational weaknesses, which induce and set individuals up for failure, by establishing and managing error defences."* This IAEA document also addresses human factors concepts as well as Corrective Action Program concepts. Industry believes the elements of a human performance program -- as a subset of human factors program -- need to focus on those related to "the behaviours and the results of human activities when carrying out work tasks" and not the job site, process and organizational factors that are covered under other aspects of the human factors program. Most nuclear utilities have separate processes for documentation management, fitness for duty, ergonomics, human performance, etc.

Q4. Do you agree with the elements of a human performance program listed above? Are there items that you would add to or remove from the list above? Please explain.

SNC-Lavalin Nuclear shares some of the Industry's concerns that the elements of the human performance program in DIS-16-05 could be interpreted as being not well aligned with the range of practices within existing nuclear facilities and licensed activities, and some elements being viewed as too prescriptive (i.e., the elements as listed are not all inclusive). As an example, human factors in design, as defined in Section 1 of CSA N290.12-14 is not included in the list in DIS-16-05., but is mentioned as an "Other element".

In addition, some readers of DIS-16-05 could interpret this document to mean that an organizational design and a stand-alone program are required, rather than taking advantage of the synergies and best practices of an integrated approach within the management system.

Again, industry encourages the CNSC to conduct a workshop with all interested parties to discuss the elements of a human performance program once commonly understood and accepted definitions are derived.

Q5. Do you agree with the concept of a human performance program described above? If you would propose other ways of viewing a human performance program and its elements, please describe them.

SNC-Lavalin Nuclear has concerns about the concept of a human performance program that is standalone. The CNSC should allow the licensees the ability to incorporate human performance and elements of human factors into their activities in an integrated manner that best suits their management system.

Typically programs require distinct processes that can be easily described and performed with clear, measurable goals and outcomes. Industry believes the best human performance program is not a stand-alone program document, but one where the elements are integrated within the appropriate parts of the management system as outlined in **CSA N286-12** and **IAEA Safety Fundamentals No SF-1**. The CNSC references SF-1 on page 6-7 as identifying "the need for an integrated approach to human performance (sections 3.12 and

3.14).”

Q6. Do you think that the requirement to have a human performance program should be applied using a graded approach to all CNSC-licensed facilities and activities? If so, what might this graded approach look like?

As stated in the previous responses, the need for a human performance program is unclear. The mandate of the CNSC is to protect the health and safety of Canadians and the environment. Imposing regulations in this area would add a significant administrative burden upon licensees which would not necessarily make operations safer, just more complex.

Every nuclear facility and licensed activity has a variety of factors that make up risk. The higher the risk, the more focus there has to be on improving human performance. Industry believes a graded approach works well, but feels the discussion paper does not do much to enable the application of a graded approach. Instead, DIS-16-05 can leave the reader with the impression that a human performance program would have very prescriptive lists of objectives, elements, and practices. Industry supports the CNSC alternative outlined on page 8 beneath the heading Graded Approach, which says, “a human performance program may be a defined and collectively managed set of interfaced activities and initiatives, which consider the elements of human performance and aims of the program, but without being a formal program within the management system.”

It is very difficult to describe a graded approach for the application of human performance in an abstract description. The graded approach needs to be applied within specific activities, to be commensurate with the safety risk of the activity.

Q7. Which type of human performance program (a formal program or otherwise) is most appropriate for the types of nuclear facilities most relevant to your comments, and why?

SNC-Lavalin Nuclear shares some of Industry’s concerns with the distinction of a “formal” program or otherwise. A graded approach means some licensees will focus on certain aspects of human performance (with justification) and other facilities will focus on a different set of human performance elements (again, with justification provided in their planning/program documentation.) The focus should be on: (a) How does a licensee’s management system address the human performance elements? (b) How is this approach relevant/important for a licensee’s particular facility or activities?

Q8. Do you propose any additional or alternative expectations of a human performance program?

SNC-Lavalin Nuclear shares some of Industry’s concerns that the expectations outlined in section 9 are too formal and prescriptive. In many cases, they not provide clear expectations but simply examples of application of human performance practices, which would be useful as illustrative examples in guidance.

We encourage the CNSC to host a workshop with all interested parties to discuss this and all other questions posed in this discussion paper in an effort to build a shared understanding.