Overview of CanWEA position on ASME A17.8/CSA B44.8-16 - Standard for wind turbine tower elevators

Service lifts used in wind turbines are unique with respect to their location, intended use, and restricted public access. They also require specific tools, training and knowledge as compared to conventional, publicly accessible passenger elevators. While industry practices have led to safe application and usage to date, the general nature of previously released standards left a gap in coverage of this unique service lift application leading to unregulated operation. ASME A17.8/CSA B44.8-16 provides a more focused approach to the standardization of wind turbine tower service lifts which in turn has the potential to lead to new regulations across the various Authorities Having Jurisdiction (AHJs) within Canada. It is the intent of this document to provide regulating bodies with essential information from the wind industry to support decision making and potential regulatory developments.

In order to ensure both worker safety and longevity in all aspects of wind turbine operation and maintenance, the wind industry strives to use service lifts in a responsible manner. Service lifts used as part of wind turbine scheduled and unscheduled maintenance activities are used a few times a year by trained and qualified employees and wind turbine technicians. Service lifts, unlike public passenger elevators, are considered tools and are designed, inspected, used and maintained by the industry and therefore do not pose a danger to the general public.

The Canadian Wind Energy Association’s (CanWEA) position outlined in this document is informed by the following:

- There are unique features to service lifts employed in wind turbines that require a specialized approach with respect to design and inspection. Service lifts used in wind turbines are designed and installed by original equipment manufacturers of wind turbines (OEMs) or specialized service lift manufacturers;
- Based on typical maintenance practices, service lifts are generally used infrequently. Wind turbines are often located in remote areas with limited means of access or distributed across large geographical areas leading wind farm operators to minimize turbine entry as much as possible;
- Wind turbines in Canada are maintained by specially trained turbine technicians that have the unique tools, knowledge and training required to install, maintain and inspect service lifts in the wind turbine fleet for which they are responsible.
- Wind turbine towers remain locked and secured and on private property restricting public access.
Based on the statements above, CanWEA believes that when applying ASME A17.8/CSA B44.8-16 AHJs should account for the following recommendations:

- Canadian regulators should adopt the standard in a uniform manner as much as possible.
- AHJs should reduce the differences between requirements for design approval;
- 3-year rotating inspection schedules should be permitted in coordination with wind turbine operators to reduce the strain on AHJ resources and widely distributed wind turbine technicians.
- The wind industry should be enabled to employ its own, well trained workforce, to inspect service lifts;
- Wind turbine operators should rely upon manufacturer supplied maintenance control plans (MCPs) and training for service lift installation and maintenance practices; and
- Not to defer to public passenger elevator regulations without first considering the restricted access and unique application of wind turbine service lifts.

**Key benefits of a specific standard for wind turbine service lifts**

CanWEA believes that the adoption of a common standard across Canada could help to achieve efficient use of limited resources.

Having a single, clear reference adopted by all the AHJs in Canada would help to:
- Improve the safety of wind farm employees by providing a clear set of training and inspection requirements that are well vetted and consistent across all operations.
- Reduce the work load necessary to meet local design requirements and related expenses;
- Focus efforts on a limited number of standard committees and consequently, to have better anticipation and control on the evolution of the technology.
- Simplify compliance for the companies working in multiple jurisdictions within Canada.

CanWEA believes that this standard provides enough flexibility to maintain sustainable operations. However, there are some concerns within the industry regarding the implementation of such a standard. Experiences from the regulation of ASME A17.8 in a few jurisdictions within the U.S.A. have highlighted some of the debilitating restrictions that can be imposed if application of the standard does not account for the statements.
made in this document. For example, inspection frequency demands have been known to require the full-time employment of direct or contract staff simply to keep up with the requirements of service lift inspections. Industrial wind farms operate with small teams of well trained personnel and the addition of one or more employees significantly affect operational budgets and even wind farm viability. This has led to added burden on finances as well as wind turbine technicians as service lifts are systematically removed from wind turbines simply due to the strain of compliance.

The following sections of this document serve to highlight the unique conditions found in the application of service lifts within wind turbines along with concerns and recommendations for implementation of ASME A17.8/CSA B44.8-16.

**Design Compliance**

Service lifts are designed, installed, and tested by wind turbine manufacturers or specialized service lift manufacturers who also supply the maintenance control plan (MCP) for the systems. Manufacturers are required to comply to Canadian requirements for the design and implementation of these systems.

**Current situation**

Since it is not the same standard that applies in all provinces, the technical requirements for design and inspection can vary between regions. In addition, design requirements can be imposed by a variety of separate standards within each region.

**Areas of Concern**

The lack of consistent standards across Canada could lead to the development of non-safety specific design requirements by the AHJ. Wind turbines are typically designed to comply with global standards for supply to markets around the world. Design requirements that are specific to a limited area within Canada produces challenges for compliance and the proper deployment of these very localized design changes.

**Recommendation**

In order to improve competitiveness and ensure quality, CanWEA believes that all AHJs in Canada looking to regulate to ASME A17.8/CSA B44.8-16 should coordination the application of
the standard to provide a single set of design requirements consistent with global standards.

**Frequency of Use – Inspections and Testing**

There are two types of inspection according to ASME A17.8 Section 2:
- Acceptance inspections and tests
- Periodic inspections and the witnessing of tests

Both inspections require supervision by a certified inspector. Acceptance inspections are one time isolated events. Periodic inspections relate to the ongoing operations and maintenance activities and will be the intent of the word “inspection” for the remainder of the paper unless otherwise specified.

**Current situation**

The typical frequency of inspection and testing of public passenger elevators in all provinces is once per year, however, in some cases an agreement can be made to adjust inspection schedules.

**Concern**

As previously noted, wind turbine service lifts are tools employed by wind turbine technicians and are typically only used a few times per year. In contrast, public passenger elevators can be used many more times in one day than wind turbine service lifts are used in a year. This equipment is also designed, installed, tested and maintained by well trained employees, possessing the necessary knowledge and skills to undertake their work tasks. Given this, yearly inspection is unnecessary, and will lead to higher costs and inefficient use of resources.

**Recommendation**

In accordance with similar requirements in Europe (Machinery Directive 2006/42/ec), CanWEA supports inspection and testing of wind turbine service lifts once every 3 years for inland areas and once every 2 years for maritime areas where salt air corrosion is a concern. Specific maritime duty rated service life equipment would be inspected on a 3-year cycle for maritime areas. This would be performed in the presence of an authorized inspector under guidance of the AHJ.
It is also recommended that a rotating inspection system be considered acceptable. For example, a certain percentage of wind turbines on a wind farm is inspected the first year. The same number but different turbines are inspected the second year and so on until the wind farm has been fully inspected. At this time the rotation is started again. This provides for a yearly inspection of the general state of the machines with regards to issues such as corrosion and wear but does not impose the burden of inspecting every turbine in one year. This has the benefit of stable budgeting of both time and finances for both the wind farm operator and the AHJ.

Trained Personnel – Inspectors

Current situation

Depending on the province, the inspector can be a licensed contractor, a third-party contractor, or a direct representative of the AHJ. Each AHJ is responsible for the accreditation requirements within their jurisdiction.

Concern

The existence of different inspector accreditation programs and inspection procedures for each province is inefficient because it will lead to poor use of existing resources, coordination difficulties and produce safety concerns. Since wind turbines can be installed in remote areas, access to these sites can be difficult throughout the various seasons. Coordinating times of access and proper adherence to safety procedures for off-site inspectors is problematic, especially if they require annual inspections which can only be carried out by a limited number of inspectors. Consequently, the inspection of wind turbine service lifts by external inspectors has the potential to become costly, and may not be feasible in all circumstances. In addition, due to the specialized application of these lifts, inspectors must be trained and qualified for unique fall protection/arrest and self-rescue scenarios. This has the potential to both disqualify inspectors of publicly accessible elevators or place them at increased risk if they are trained but not experienced in this work environment.

ASME A17.1 stipulates that:

"The inspector shall meet the qualification requirements of ASME QEI-1. Inspectors and inspection supervisors shall be certified by an independent, accredited, certifying organization as specified in 8.10.1.2 (see Section 1.3)."
Recommendation

It is recommended that wind turbine operators are permitted to inspect and maintain service lifts with the approval of the relevant AHJ based on manufacturer provided maintenance control plans and training. Inspection logs that are maintained and collected by the operator would provide documentation that can be presented to the designated AHJ representative to demonstrate compliance in a much more efficient manner.

Trained Personnel – Service Lift Installation and Maintenance

Current situation

Each province has its own certification program for elevator mechanics. These programs include many aspects of the public passenger elevator industry, however specific technologies for wind turbine service lifts are either not included or not properly developed. Depending on existing licenses, elevator mechanics can obtain licenses from other provinces under the mobility act.

ASME A17.8 provides the following definition of elevator personnel:

“persons who have been trained in the construction, maintenance, repair, inspection, or testing of equipment.”

Concerns

Existing training programs for public passenger elevator mechanics are not adequate to ensure worker safety with respect to inspection and maintenance of wind turbine service lifts. In addition, the vast majority of the training programs cover technologies or requirements that are not applicable to wind turbine service lifts. Furthermore, as noted above, the unique aspects associated with wind turbine service lifts, as well as the unique installation, testing and maintenance procedures associated with wind turbine service lifts, are not covered by existing conventional elevator training programs. This lack of wind industry-specific training has the potential to lead to injuries or accidents during installation, testing and maintenance, and to increase the potential of equipment failure if conventional elevator mechanics are widely employed.

However, given the number of wind turbine service lifts installed in a given province can be
small and can vary, it is difficult to justify a program to train and certify service lift mechanics for each province. Finally, the mobility act is limited to only a few provinces and is not currently available for WTE mechanics.

Recommendation

Based on the statements above, CanWEA recommends establishing a training program based on manufacturers’ experience which could be provided by wind turbine manufacturers. This would provide an opportunity for wind turbine specific training and allow for wind turbine operators to train service personnel internally relieving the strain on acquiring external resources and enforcing regulation of remote facilities by utilizing the workforce already working in these regions. AHJs could then designate properly trained and qualified wind farm personnel to perform and document the inspections for third-party evaluation. Much of the inspection process is based on measurement and performance observation – the verification of the proper functioning of safety devices by creating deliberate extreme situations – and weight testing. This secondary inspection of documentation can be performed much more efficiently and without the deployment of personnel to remote areas.

Restricted public access

Current situation

In general, wind turbines are constructed on private property. They have a single point of entry which remains locked at all times unless authorized personnel are present inside the tower. Since the service lifts are inside the tower there is no access to the general public.

Concern

The concern is that AHJs will apply regulations that do not take this into account. It is acknowledged that wind turbines are a unique application but most experience by regulating bodies will be with public passenger elevators. By approaching the standardization of service lifts in wind turbines as a publicly accessible elevator, unreasonable restrictions can be placed on its use, maintenance and inspection.

Recommendation

In application of this standard consider the differences in operations and reduce the carry-over of standard public passenger elevator mechanic practices, consulting with the wind industry to
establish relevant requirements for restricted access service lifts. It is recommended to not defer to existing regulations for public passenger elevators.

**Conclusion**

In conclusion, we wish to thank you for considering our recommendations within the unique context of wind turbine services lifts. The Canadian Wind Energy Association is open to dialogue with all AHJs within Canada and looks forward to any opportunity to represent our national wind industry for the benefit of all people working with this important source of renewable energy.

In summary, CanWEA recommends:

- Canadian regulators should adopt the standard in a uniform manner as much as possible.
- AHJs should reduce the differences between requirements for design approval;
- 3-year rotating inspection schedules should be permitted in coordination with wind turbine operators to reduce the strain on AHJ resources and widely distributed wind turbine technicians.
- The wind industry should be enabled to employ its own, well trained workforce, to inspect service lifts;
- Wind turbine operators should rely upon manufacturer supplied maintenance control plans (MCPs) and training for service lift installation and maintenance practices; and
- Not to defer to public passenger elevator regulations without first considering the restricted access and unique application of wind turbine service lifts.