



SAFETY CODES COUNCIL

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COUNCIL ORDER No. 0015427

**BEFORE THE BUILDING TECHNICAL COUNCIL
On September 5, 2012**

IN THE MATTER OF the Safety Codes Act, Revised Statutes of Alberta 2000, Chapter S-1.

AND IN THE MATTER OF the Order dated May 25, 2012 issued by an Accredited Agency (Respondent) against an Oil Sands Company (Appellant)

UPON REVIEWING the Order **AND UPON HEARING** the Appellant and the Respondent; **THIS COUNCIL ORDERS THAT** the Order is **VARIED**.

From: *"Install standpipe systems in:*

- Cogeneration building BU-393 (RWB B 0320 12 MU)*
- De-oiling Building BU-190 (RWB B 0321 12 MU)*
- Water Treatment Building BU-290 (RWB B 0322 12 MU)*
- Steam Generation Building BU-390 (RWB B 0323 12 MU)*

Installation to be completed during the construction process which is unknown at this time."

To: You are hereby ordered to comply with the Alberta Building Code – Specific Requirements section detailed in the Plans Examination Reports issued by the Respondent, excluding the requirement for a standpipe system referenced in Articles 3.2.5.8. and 3.2.5.9. but including the requirement to provide a water supply referenced in article 3.2.5.7. of the Alberta Building Code 2006. The Plans Examination Reports were issued by the Respondent on March 20, 2012 for the Cogeneration Building BU-393, on June 27, 2012 for the De-Oiling Building BU-190, on March 17, 2012 for the Water Treatment Building BU-290, and on March 20, 2012 for the Steam Generation Building BU-390.

Issue:

1. The Appeal concerns four oil process buildings (“the Buildings”) to be constructed as part of Phase 2B of the Appellant’s project site (“Site”).
2. The issue on appeal is:
 - (a) The requirement to install a standpipe system in accordance with Articles 3.2.5.8. and 3.2.5.16. of Division B of the Alberta Building Code 2006 (ABC 2006). The Code requires that if a building is more than 14m high a standpipe system must be installed. The four process buildings at the Appellant's site will be constructed to more than 14m high encompassing process piping and equipment.
 - (b) The Appellant proposes, as an alternative solution to the standpipe system, various layers of protection to identify, mitigate, and respond to hazards.
 - (c) The Respondent indicated that he did not have the authority to accept the Appellant's alternative solution to waive the requirement for a standpipe system.

The Record:

3. The Appeal Panel considered, or had available for reference, the following documentation:
 - (a) A Hearing Brief Binder from the Appellant.
 - (b) Stay of the Order, dated August 15, 2012, from the Building Technical Council to the Appellant.
 - (c) Written notification of appeal hearing, dated August 10, 2012, from the Coordinator of Appeals to the Appellant.
 - (d) Acknowledgement of notice of appeal, dated August 8, 2012, from the Coordinator of Appeals to the Appellant.
 - (e) Notice of Appeal dated August 3, 2012, from the Appellant to the Coordinator of Appeals.
 - (f) Request for Review of the Order, dated July 31, 2012, from the Appellant to the Acting Chief Building Administrator.
 - (g) Order dated May 25, 2012 issued by the Respondent to the Appellant.

- (h) Exhibit #1 Appellant -A Hard Copy of Power Point Slide Presentation "Appeal to Eliminate Mandatory Wet Standpipe Systems at the site's SAGD Plant Phase 2B CPF"
- (i) Exhibit #2 Appellant -"Supplementary Information Provided at the Hearing"
- (j) Exhibit #I Respondent – A Six-tabbed hearing brief including Permit Applications, Plans Review Reports, Request for Variance and Variance Response, a Copy of the Order, and Comment from the Municipal Fire Marshal.

Position of the Parties

Appellant

4. The Appellant's position is that:

- (a) The Appellant is seeking a variance from the ABC 2006 requirement to install standpipe systems in the four process buildings.
- (b) Eliminating the standpipe system achieves a greater safety performance. Fire protection will be provided by several layers of protection and personnel safety is assured by automatic evacuation and emergency shutdown.
- (c) A safety specialist has reviewed the ABC 2006 requirements with regards to standpipe systems and the specialist determined that implementing the standpipe system would introduce a significant life safety hazard.
- (d) The use of standpipe hose systems inside a hydrocarbon process building introduces a significant life safety hazard and water will not extinguish Class B Hydrocarbon Fires. Including the standpipe system does not provide any safety value and introduces a significant life safety hazard risk that would otherwise not be present. Hydrocarbons do not have an incipient stage prior to ignition. The transition from gas/vapour release to flaming combustion is instantaneous once the conditions of ignition are met. The rate-of-heat rise following ignition results in temperatures in excess of 1000°C within seconds and the generation of dense black smoke that is significantly more than that produced by Class A combustibles. This makes it impossible for personnel to remain inside the building to use a standpipe hose system.
- (e) The proposed alternative solution is a design that focuses on fire-safe process isolation controls, emergency egress, a defensive fire response strategy and an emergency shutdown system that better suits the type of fires that could be encountered in the Buildings.

- (f) The Appeal is based on life safety concerns, not economics.

Respondent

- 5. The Respondent's position is that:
 - (a) Article 3.2.5.8. Division B of the ABC 2006 does not contemplate the type of fire hazard that the standpipe system is intended to protect. The Code does not distinguish between Class A combustible fire hazard and Class B hydrocarbon.
 - (b) The Respondent does not have the authority to accept the Appellant's proposed alternative solution to waive the ABC 2006 requirements for a standpipe system.

Provisions of the Safety Codes Act

- 6. The Safety Codes Act provides:

Council considers appeal

52(2) The Council may by order
 - (a) confirm, revoke or vary an order, suspension or cancellation appealed to it and as a term of its order may issue a written variance with respect to any thing, process or activity related to the subject-matter of the order if in its opinion the variance provides approximately equivalent or greater safety performance with respect to persons and property as that provided for by this Act,

Provisions of the Alberta Building Code 2006 (ABC2006):

- 7. The applicable code is the Alberta Building Code 2006 (ABC 2006). Permit applications, design and planning for the Buildings are occurring under the current Code which is the ABC 2006.
- 8. The Alberta Building Code 2006 provides:

Division B
3.2.5. Provisions for Firefighting
3.2.5.7. Water Supply

1) Except as required in Sentences (3) and (4), and except for a building that is neither more than 3 storeys in building height nor more than 600 m² in building area, a building shall have a supply of water available for firefighting purposes that is not less than the quantity derived from the following formula:

$$Q = V \times O \times S$$

where

- Q = minimum water supply (litres),
- V = total building volume (cubic metres),
- O = water supply coefficient (from Table 3.2.5.7.),
- S = spatial coefficient whose value is 1.5. for a building that has any limiting distance less than 7.5. m, otherwise whose value is 1.0.

Table 3.2.5.7.
Water Supply Coefficient
Forming Part of Sentence 3.2.5.7.(1)

Type of Construction	Classification by Group and Division in Accordance with Table 3.1.2.1.				
	A-1, A-3, F-3	A-2, B-1, B-2, C, D	A-4	E, F-2	F-1
	Applicable Water Supply Coefficient				
A building of non-combustible construction with all loadbearing walls, columns and arches, having a fire-resistance rating at least equivalent to that required for the supported assembly, but not less than 45 min	11	10	14	17	23
A building of noncombustible construction in accordance with Article 3.1.5.1.	17	15	20	25	34
A building having all structural members of non-combustible material, or if of combustible material, a fire-resistance rating of at least 45 min, or of heavy timber construction	22	19	27	34	45
A building of combustible construction	34	27	40	50	67

- 2) The water supply required by Sentence (1) shall be capable of being delivered at a rate of not less than 45 Lis for a building required to have a quantity less than 75000 L and at a rate of not less than 60 Lis for a building required to have a quantity of 75000 L and greater.
- 3) Water supply for a standpipe system shall conform to the requirements of NFPA 14, "Installation of Standpipe and Hose Systems."

- 4) Water supply for a sprinklered building shall conform to the requirements of
 - a. NFPA 13, "Installation of Sprinkler Systems," or
 - b. NFPA 13R, "Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height."

3.2.5.8. Standpipe Systems

- 1) Except as permitted by Sentence 3.2.5.9.(4), a standpipe system shall be installed in a building that is
 - a) more than 3 storeys in building height,
 - b) more than 14 m high measured between grade and the ceiling of the top storey, or
 - c) not more than 14 m high measured between grade and the ceiling of the top storey but has a building area exceeding the area shown in Table 3.2.5.8. for the applicable building height unless the building is sprinklered throughout.

Table 3.2.5.8.
Building Limits without Standpipe Systems
Forming Part of Sentence 3.2.5.8.(1)

Occupancy Classification	Building Area, m ²		
	1 storey	2 storeys	3 storeys
Group A	2500	2000	1500
Group C	2000	1500	1000
Group D	4000	3000	2000
Group F, Division 2	1500	1500	1000
Group F, Division 3	3000	2000	1000

3.2.5.16. Fire Department Connections

- 1) The fire department connection for a standpipe system shall be located so that the distance from the fire department connection to a hydrant is not more than 45 m and is unobstructed.
- 2) The fire department connection for an automatic sprinkler system shall be located so that the distance from the fire department connection to a hydrant is not more than 45 m and is unobstructed.
- 3) The fire department connection referred to in Sentences (1) and (2) shall be located no closer than 3 m and no further than 15 m from the principle entrance to the building.

Findings of Fact:

9. The Buildings in question are not yet constructed. The appellant is seeking a variance from the requirements of article 3.2.5.8. , Division B of the ABC 2006 and does not intend to pursue construction of the Buildings until a decision is made on whether the alternative solution will be accepted. (Chronology Section of Appellant's Hearing Brief, The Record 3(a))
10. The Buildings are classified under article 3.2.2.82. of Division B of the ABC 2006 as Group F, Division 3 low hazard industrial. Each building will be one storey. The Cogeneration building will have a building area of 1674 m² with a height of 21 m for the building and 8 m for the annex. The De-Oiling building will have a building area of 3674 m² and 19.2 m in height. The Water Treatment Building will have a building area of 4093 m² and 17.7 m in height. The Steam generation building will have a building area of 3045 m² and 17.9 m in height.
11. The Appellant applied on April 24, 2012 to the Respondent for a variance request to eliminate standpipe systems in the Buildings.
12. On May 15, 2012 the respondent denied the request for the variance citing that "there was insufficient indication that an equal or greater level of safety will be achieved." (The Record 3G), Exhibit #1 Respondent, Tab 2, Variance Response)
13. The Appellant and Respondent then determined that the issue should go to Appeal to determine whether a variance could be granted to eliminate the requirement to provide a standpipe system in the Buildings.
14. The Order was issued on May 25, 2012 and the Appellant filed notice of appeal on June 4, 2012.
15. The proposed alternative solution employs a defensive fire response strategy with engineered fire protection systems and passive fire protection. The strategy relies on an automatic plant-wide emergency shutdown and evacuation system and engineered mitigation systems. The layers of protection is designed to eliminate credible leakage points, control sources of ignition, relocate fire hazard equipment outdoors if possible, place equipment within the Buildings to reduce fire exposure, use drainage systems to minimize fire exposure, detect fire and gas with alarm action, isolate fuel, and uses enhanced seal technology and barrier fluid systems. If there is an emergency incident, by the time that ignition occurs the entire plant is shut down and personnel are evacuated to muster points. As indicated in testimony, the Appellant's employees participate in site evacuation and simulated shutdown drills four times per year and written health and safety procedures are on file, complete and ready for use.
16. The Plans Examination Reports located behind Tab 9 of the Appellant's Hearing Brief (The Record 3 (a)) lists the ABC 2006 specific requirements for compliance. Included in the requirements is article 3.2.5.7. of Division B of the ABC 2006. The

intent of article 3.2.5.7. is that an adequate water supply for firefighting be readily available and of sufficient volume and pressure to enable emergency response personnel to control fire growth so as to enable the safe evacuation of occupants and the conduct of search and rescue operations, prevent the fire from spreading to adjacent buildings, and provide a limited measure of property protection.

Reasons for Decision:

17. The Appeal Panel accepts the evidence presented that indicates that a standpipe system in oil process buildings are a safety hazard and that the use of water to extinguish Class B Hydrocarbon Fires is ineffective.
18. The Appeal Panel accepts that the Appellant's proposed alternative solution as described in the layers of protection in design and the hazard mitigation processes will provide an equivalent or greater level of safety to persons and property.
19. In accepting the alternative solution, the Appeal Panel does so with the understanding that other requirements of the ABC 2006, including those mentioned specifically in the Plans Examination Reports, will be complied with.
20. The Appeal Panel's inclusion of the requirements of article 3.2.5.7. for this Order is to ensure compliance with the ABC 2006 and to ensure that there is a water supply for firefighting available to prevent fire from spreading to adjacent buildings and to provide a limited measure of property protection. Its inclusion is not intended to supply a standpipe system in the Buildings.

Dated at Edmonton, Alberta this 19th day of October, 2012

Chair, Building Technical Council Appeal Panel