

Author <i>Auteur</i>	Release date <i>Date émission</i>	Doc. no. <i>No. de doc.</i>	
WOL	12/20/2008	SA-08-021 Wolfurt KD08003E	

SAFETY ALERT BULLETIN

Lift manufacturer / Fabricant :	Hall, VonRoll, Thiokol, CTEC, Garaventa CTEC, Doppelmayr, Doppelmayr CTEC	Fab. Group / Groupe de fabrication :	FAB GROUP 25 – Tower Equipment
Lift type / Type de remontée :	All lifts	Effective date / Date en vigueur :	December 20, 2008
Supersedes / Remplace :	N/A		

Title: Tower Failure Due to Water Intrusion

1. Generalities

1.1 Abstract of issue (summary)

In direct response to a recent incident, the Doppelmayr main office in Wolfurt, Austria has released the attached Safety Alert Bulletin KD08003E.

1.2 Reason for release (summary)

See attached Doppelmayr Wolfurt Safety Alert Bulletin KD08003E.

2. Scope

See attached Doppelmayr Wolfurt Safety Alert Bulletin KD08003E.

3. Action to be taken and completion date

(Inspection, modification, replacement, NDT, part, manual revision, procedural change)


All actions prescribed by attached Doppelmayr Wolfurt Safety Alert Bulletin KD08003E must be completed and documented by all customers.

4. Detail of issue

Text, drawings, schematics

See attached Doppelmayr Wolfurt Safety Alert Bulletin KD08003E.

DOPPELMAYR SEILBAHNEN GmbH, WOLFURT

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-	-			Towers			
Abgeleitet von / Based on:	SA-06-022 Safety Alert Bulletin						
Classification Code:	x	OS	O	IS	I		

Tower failure due to water intrusion

1. General

1.1 Abstract of issue (summary)

Accumulated water within tower tubes and other hollow sections that have a sealed base or clogged drainage (including but not limited to terminal structures, crossarms, carriers, etc.) can have catastrophic effects upon structural integrity.

1.2 Reasons for release

Recently, accumulated water within a tower tube froze and resulted in a complete failure of the tower splice plate weld. The failure occurred during operation on an 8MGD installation built in 1994 in Canada. The affected tower design was a two-section tower of which the lower section had an opening for concrete fill in the top plate. The lower section was filled approximately 70% with concrete. The remaining space within the tower tube filled up with water which froze and expanded causing the upper section of the tower to separate and fall.

Inspections subsequent to the event, have reported that water or ice has been discovered in towers and other structural members. In some instances, damage to structure members has been noted.


2. Scope

2.1 Affected model, type, parts

While the noted failure involved a 1994 Doppelmayr two-piece tower on a detachable gondola, any tower design or other hollow structures that have a sealed base or clogged drainage could be similarly affected if there is a pathway for water intrusion or an opening for air to enter and cause condensation.

This bulletin specifies describes tower inspections but also applies to terminal masts and other hollow structures with a sealed base. If the presence of water/ice is found or suspected within other hollow structures, consult with the nearest Doppelmayr office for review and recommended procedures.

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3. Action to be taken / Completion date

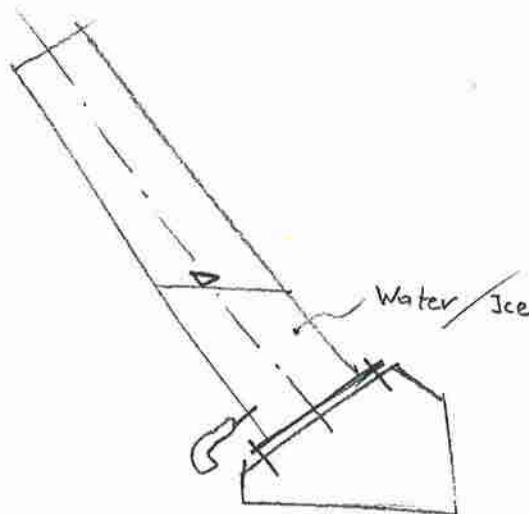
3.1 Required Actions: inspections ASAP but at the latest within the next 30 days

ASAP / no later than within the next 30 days, a resonance check and visual inspection of each tower tube or other hollow structure with a sealed base must be completed.


3.1.1 Resonance check: Each tower tube or other hollow structure with a sealed base must be checked for the presence of internal water/ice. When struck with a hammer in several ascending points from the base, a change in the resonating tone of the tower may indicate the presence of water/ice (a tower with water/ice or concrete tends to exhibit a solid "dead" sound compared to a more normal bell-like tone). Some tone differences may be noted due to proximity to base gussets or the presence of internal concrete (see additional information within Section 3.1.2) and will not necessarily indicate the presence of water.

If with a resonance check, water/ice is suspected to be present within the tower but further than 4" (100 mm) from the top plate, a small hole 3/8" - 1/2" (10 - 12 mm) must be drilled near the tower base at the downhill side of the tower along the centerline of the lift 2" to 4" (50 - 100 mm) from the tower base to provide a pathway for water to escape. See illustration below.

If with a resonance check, water/ice is found or suspected inside the tower within 4" (100 mm) of the top plate (see Section 3.1.2) **this shall be cause for immediate and continued closure of the lift to public transportation** and must be reported to the nearest Doppelmayr representation office for review and recommended repair procedures.



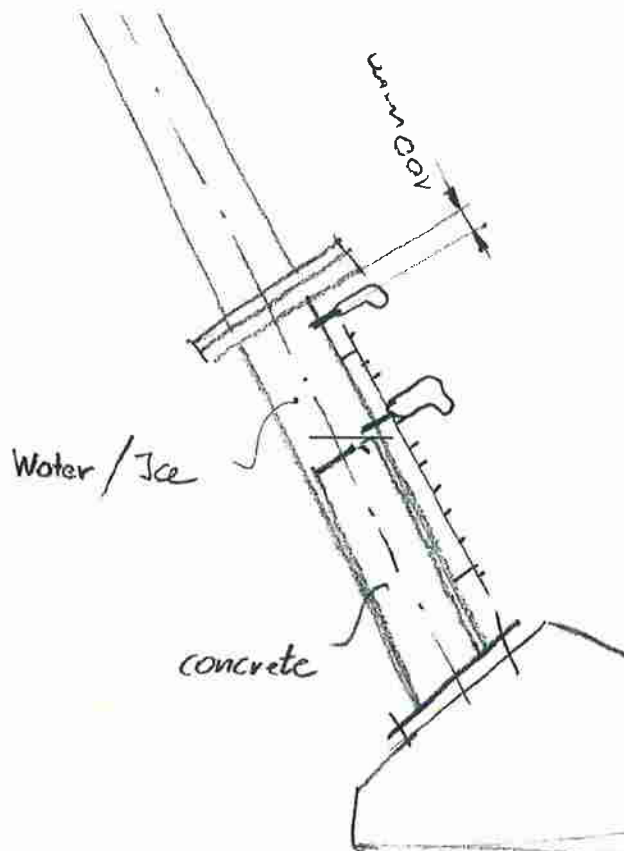
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3.1.2 Concrete-filled shafts / shaft sections

For tower shaft sections partially filled with concrete through the top plate, check the tower section with the hammer method as described previously. If water/ice is suspected, drill a small hole 3/8" - 1/2" (10 - 12 mm) approx. 2 inches (50 mm) below the top plate on the uphill side of the tower (behind the ladder). Tower shafts with a cover for concrete fill on the outside of the shaft already have a drain hole and the cover can be removed for inspection purposes. **If ice is found in this section, this shall be cause for immediate and continued closure of the lift to public transportation** and must be reported to the nearest Doppelmayr representation office for review and recommended repair procedures.

A small drain hole 3/8" - 1/2" (10 - 12 mm) is required to eliminate the water above the concrete level. See illustration below.



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Required Actions: 30 day inspections (continued)


3.1.3 Visual inspection: Each tower tube or other hollow structure with a sealed base must be checked for signs of fatigue or deformation caused by ice. Any suspected indication noted visually must be confirmed by magnetic particle examination. The presence of any confirmed indication must be reported to the nearest Doppelmayr representation office for review and recommended repair procedures. Any confirmed indication greater than 1 inch (25 mm) **shall be cause for immediate and continued closure of the lift to public transportation** until repairs are authorized by Doppelmayr and implemented.

3.2 Required Actions: Annual Inspections

Routine annual maintenance must include a close visual inspection of all tower components including the tower bases and splice connection plates. Signs of fatigue due to freeze / thaw cycles of cyclic loading may present themselves as indications (cracks) during the early stages, therefore, all welds, gussets and tower tubes should be subjected to close visual inspection annually. Any suspected indication noted visually must be confirmed by magnetic particle examination. The presence of any confirmed indication must be reported to the nearest Doppelmayr representation office for review and recommended repair procedures.

A small hole 3/8" - 1/2" (10 - 12 mm) must be drilled near the tower base at the downhill side of each tower along the centerline of the lift 2" to 4" (50 - 100 mm) from the tower base to provide a pathway for water to escape. This hole must be inspected annually and kept clear of debris. Where there are upper tower sections that are not open to the base section, a hole must also be drilled along the centerline of the lift 2" to 4" (50 - 100 mm) above the tower section base plate. This hole may be drilled on the ladder side of the tower.

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4. Detail of issue

Text, drawings, schematics



Tower with 2 x 6T/2FR assemblies;
16,7m tall; 9,7m of 30" tube spliced
to 7m of 24" tube.

Lower tower section filled approx.
5m with concrete, the remainder
with ice.

Temperature approx. -12°C/10°F.

Bottom tower section top flange
plate was pushed off the shaft by
ice and caused top tower section to
separate and fall.

The comm. line and the haul ropes
supported the tower head so the
upper section came to rest in a
more or less vertical position on the
ground.