

Applying the Quantified Risk Scale ABC Trucking Ltd

This example uses a fictitious BC trucking company to demonstrate a step-by-step process to identify hazards and use the **Quantified Risk Scale** to evaluate risks, and prioritize them for action.



The Company

ABC Trucking Ltd is a busy trucking company with terminals in Kelowna, Cranbrook, Prince George and Terrace. From its Abbotsford headquarters, ABC operates a produce shipping service that includes picking up produce from local growers, delivering to local packaging plants and distributing to grocery stores throughout the lower mainland and to distribution centres in regional terminals. ABC Trucking has a fleet of 50 units including 20 one-ton cube vans, 10 five-ton trucks and 20 tractor-trailer units. ABC employs 75 people, including 63 drivers (50 full time, 13 part time) and 12 management, supervisory and administrative staff.

The ABC Risk Assessment

All ABC employees do some work-related driving. However, the ABC Trucking safety committee knows there are important similarities and differences in the driving environments – and therefore the hazards – ABC drivers encounter. Reasoning that drivers with similar risk experiences will benefit from similar hazard elimination and risk management measures, the safety committee sees that once they identify those similarities and differences, they can organize ABC drivers into logical groups. This will enable them to conduct a risk assessment for each group rather than for each occupation or role.

They apply the following steps.

Step 1. List jobs in which employees drive for work-related purposes

Step 2: Summarize driving circumstances; group jobs with similar driving circumstances

Step 3. Identify the hazards each driver group encounters

Step 4. Assess and prioritize risks

Step 5. Develop measures to eliminate or minimize risks

Step 1. List jobs in which employees drive for work-related purposes

First, the ABC Trucking safety committee identified all those roles in which the employee undertakes some work-related driving. They built the following list.

1. Produce pick up drivers
2. Produce delivery drivers
3. Regional distribution drivers
4. Management staff – CEO, CFO, human resources, health and safety manager
5. Supervisory staff – Local pickup and delivery manager, provincial deliveries manager, fleet manager
6. Administrative staff – dispatchers, receptionist, accounting assistant, order desk.

Step 2: Summarize driving circumstances; group jobs with similar driving circumstances

ABC knows there are similarities and differences in the driving environments their employees encounter. The vehicles, schedules and kilometres that managers drive are quite different from those of regional delivery drivers. However, risks associated with rush hour traffic, slippery roads, speeding and distractions are effectively the same for one-ton drivers and five-ton drivers.

The ABC safety committee looked closely at the driving environments – the drivers, vehicles, journeys, roads and circumstances - associated with each of the six roles established in Step 1. They summarized each one based on those characteristics. See [Appendix A](#) below.

Comparing criteria in that table, the ABC Trucking safety committee decided on three groups.

- Group One –one ton and five ton drivers, supervisory staff
- Group Two –regional distribution drivers
- Group Three –management and administrative staff

Using their collective experience, and after speaking with employees in those roles, the safety committee added the following points to support their rationale for deciding on the three groups.

Group One – One-ton and five-ton drivers, supervisory staff

- One-ton and five-ton trucks have different load capacities, but they have similar body and axle configurations, are similarly equipped (e.g. lift tailgates, 2-way radios) and require similar operational skills and licensing.
- Although specific routes and schedules vary, these drivers operate in similar environments – traffic in industrial areas and during rush hours, the typical variety of Coastal weather, etc.
- One-ton drivers fill in for absent five-ton drivers (and vice-versa), so they need to be familiar with risks and solutions associated with those vehicles, routes and driving environments.
- Supervisors often drive to the same destinations and on the same roads as pickup / delivery drivers. Sometimes they fill in for absent drivers. They typically arrive early or stay late to support drivers during regular and extended shifts.

Group Two – regional distribution drivers

- 95% of the driving is on major highway routes; although these drivers encounter some of the same hazards as other ABC drivers, the frequency of exposure, probability and potential severity of incidents are substantially different.
- Regional drivers encounter winter ice and snow conditions on their routes far more often than other ABC drivers do.
- Unlike other ABC drivers, regional drivers undertake multi-day trips and widely variable schedules; they regularly face greater risks associated with fatigue and health.
- Trucks are physically larger, have greater gross vehicle weight, articulation points and different axle configurations; they require different skills and training.

Group Three – management and administrative staff

- Managers and administrative staff operate similar vehicles (four-door sedan or SUV)
- Their driving involves primarily driving themselves, plus occasional passengers, to meetings rather than delivering goods.
- Driving is a secondary or “incidental” part of their work.
- These employees have greater flexibility to schedule and plan driving to avoid peak flows.

Step 3. Identify the hazards each driver group encounters

After confirming definitions and explanations in [The Basics](#) section, the safety committee set about building the ABC Trucking hazard inventory. Rather than creating a new hazard list for each group, they used the [Road Hazard Inventory](#) as a “master list” for each of the three groups.

Using one inventory was administratively efficient and reduced the likelihood of *missing* a hazard during subsequent annual reviews. Scoring would provide the differentiation to rank risks, but would also enable ABC to compare the relative importance of hazards over time, and see how well their risk management measures were working.

Step 4. Assess and prioritize risks

The next task was assigning scores to each of the three risk variables (frequency, probability and severity) for each hazard / contributing factor to determine a score they could use to prioritize risks. Once they had re-read guidance on the [Quantified Risk Scale](#), they reviewed the Quantified Risk Scoring Guide to understand the differences among the criteria and thresholds.

To come up with meaningful results, the team looked at ABC’s near miss and incident records, considered what incidents others in their industry have experienced, spoke with several ABC drivers, supervisors and managers, and used their collective good sense and informed experience. The resulting complete ranking for Group Two (regional distribution drivers) is in [Appendix B](#).

Although they had a solid list of hazards and scores, the safety committee felt a little overwhelmed with the idea of tackling some 50 hazards. Which ones should they address first? The team saw that one approach would be to sort each hazard category to come up with the top three driver, vehicle and journey risks. In the end, they decided to sort the scored sheet based on the hazards with the highest overall risk scores, and arrive at the “top ten”. Results are in Table One below.

Table One: ABC Trucking Risk Management Priorities

Hazard Category	Hazard / Contributing Factor	Frequency of Exposure	Probability of Occurrence	Severity of Consequences	Risk Score
driver	does not recognize driving hazards or hazardous conditions and/or adapt driving accordingly	8	8	6	384
driver	fatigue - reduced vigilance, slower reactions, poor decisions	8	8	6	384
journey	drive between midnight and 6:00 a.m.	8	8	6	384
journey	unpredictable or irregular schedules, shift work, long shifts	10	8	4	320
journey	limited visibility - fog, excessive dust, travelling into sunset or sunrise	6	8	6	288
journey	poor traction conditions - winter: snow, ice	6	8	6	288
driver	distraction - responding to dispatcher call, 2-way radio	8	8	4	256
journey	aggressive or high risk driving (failing to yield right of way, passing when unsafe) by others	8	8	4	256
journey	poor scheduling - unrealistic time allowed for trip, inefficient route selection, avoidable delays not eliminated	4	8	8	256
vehicle	overloaded, or unbalanced load	6	6	6	216

Step 5. Develop measures to eliminate or minimize risks

With their priorities set, ABC Trucking starting thinking about what specific measures they could take to address each of the hazards and contributing factors. Some solutions seemed clear so immediate action could be taken. Others would require a little more work.

To determine what controls were likely to work best for tougher hazards, and to help build and implement measures to eliminate those hazards and minimize associated risks, the safety committee used resources in our [Employer Tool Kits](#) and [Building Strong Policies](#) sections.



APPENDIX A – ABC TRUCKING LTD DRIVING ENVIRONMENT COMPARISON TABLE

Date: June 17, 2015

People / drivers Included	One-ton cube van operators	Five-ton delivery truck operators	Tractor-trailer operators	CEO, CFO, HR manager, health and safety manager	Local managers, provincial delivery manager, fleet manager	Dispatchers, receptionist, accounting assistant, order desk
Vehicles driven	2-axle one-ton van with frame-mounted refrigerated container, diesel-powered, auto transmissions	2-axle five-ton truck with frame-mounted refrigerated container; diesel-powered, auto transmissions	tandem axle tractor pulling tandem or tridem-axle refrigerated trailers, auto or manual transmissions	car or SUV	½-ton pickup or SUV	car or SUV
Vehicle owner	ABC Trucking	ABC Trucking	ABC Trucking	employee	employee	employee
Number of employee - drivers	24	14	25	4	3	5
Driving frequency	Daily	Daily	Daily	2 to 4 times per week	Daily	2 to 4 times per week
Typical shift	10 - 12 hours	9 - 11 hours	13 - 16 hours	9 hours	9 hours	9 hours
Typical daily driving	7 - 8 hrs driving, 3 - 4 hours load / unload	7 - 8 hrs driving, 2-3 hrs load / unload	11 - 14 hrs driving, 2 hrs load / unload	0.5 - 1 hour	4 hours	0.5 - 1 hour
Driving on weekdays	Yes	Yes	Yes	Yes	Yes	Yes
Driving on weekends	Rarely	Rarely	Yes, depends on season	Very rarely	Yes, depends on season	Very rarely
Weekly km	1,500	1,800	5,000	300	1,000	200
Annual km	75,000	90,000	250,000	15,000	50,000	10,000
Weather conditions	Coastal – periodic heavy rain, some hot summer temperatures, fog and mist; rare snow and ice	Coastal – periodic heavy rain, some hot summer temperatures, fog and mist; rare snow and ice	Coastal and Interior conditions, all seasons	Coastal conditions; have flexibility to avoid poor driving; some heavy rain, fog; rare slippery conditions	Coastal – periodic heavy rain, some hot summer temperatures, fog and mist; rare snow and ice	Coastal conditions; have flexibility to avoid poor driving; some heavy rain, fog; rare slippery conditions



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People / drivers Included	One-ton cube van operators	Five-ton delivery truck operators	Tractor-trailer operators	CEO, CFO, HR manager, health and safety manager	Local managers, provincial delivery manager, fleet manager	Dispatchers, receptionist, accounting assistant, order desk
Traffic conditions	Light on rural routes, frequent congestion on all major routes during rush hours and peak periods in industrial areas.	Traffic all day long - frequent congestion on major routes during rush hours and peak periods in industrial areas.	Schedules avoid peak congestion, otherwise steady highway traffic, especially on Friday, long weekends, or pulses due to construction zones, emergencies or crashes.	Periodic congestion on major routes; driver can often select schedule to avoid peak flows.	Periodic rush-hour congestion esp. on major routes, driver can sometimes avoid peak flows.	Periodic congestion on major routes; driver can often select schedule to avoid peak flows.
More than 20 years driving experience (%)	20	60	70	50	100	40
5 - 20 years driving experience (%)	60	30	10	0	0	0
Less than 5 years driving experience (%)	20	10	20	50	0	60
# of drivers 65+ years old	5	6	12	2	1	2
New hires last 2 years	5	3	4	1	0	2
Rural gravel (% of total km)	10	0	0	5	5	0
Rural secondary / paved (% of total km)	10	20	0	5	10	5
Urban commercial / industrial (% of total km)	30	30	10	20	35	20
Paved highway (% of total km)	50	50	90	70	50	75



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APPENDIX B – ABC TRUCKING RISK ASSESSMENT – GROUP TWO

Organization	ABC Trucking Ltd	Date	June 19, 2015		
Group	Group two – regional distribution drivers				
Conducted by	S. Dhaliwal – owner, T. Spence – fleet manager, J. Manuel – driver, J. Grewal - driver				
Hazard Category	Hazard / Contributing Factor	Frequency of Exposure	Probability of Occurrence	Severity of Consequences	Risk Score
driver	insufficient orientation or training: driver lacks necessary competencies or is unfamiliar with procedures to operate vehicle	2	8	6	96
driver	does not recognize driving hazards or hazardous conditions and/or adapt driving accordingly	8	8	6	384
driver	failure to pay attention to driving responsibilities; complacency	4	6	6	144
driver	distraction - texting or talking on cell phone, other electronic device (e.g. GPS, radio, etc.)	6	6	4	144
driver	distraction - conversation with or interference by passenger	1	2	6	12
driver	distraction - responding to dispatcher call, 2-way radio	8	8	4	256
driver	does not know correct procedures for using equipment (e.g. how to apply tire chains)	1	1	2	2
driver	driver not familiar with route	2	8	4	64
driver	fatigue - reduced vigilance, slower reactions, poor decisions	8	8	6	384
driver	poor vision (eye health)	8	6	4	192
driver	poor nutrition and/or hydration - fatigue, attitude	6	6	4	144
driver	medical condition that affects, or could affect driving abilities (e.g. heart condition, sleep apnea)	6	6	4	144
driver	high risk driving by employee - failing to yield right of way, passing when unsafe, following too close	4	8	6	192
driver	aggressive driving by employee	4	6	6	144
driver	speeding - driving too fast for road / traffic conditions	4	8	6	192
driver	does not wear seatbelt, does not require passenger to wear seatbelt	2	4	6	48
driver	violence from passenger	1	1	4	4
driver	impaired by alcohol, medication or prescription or illicit drugs	1	10	10	100
driver	slip, trip or fall while entering or exiting vehicle	8	10	2	160

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Hazard Category	Hazard / Contributing Factor	Frequency of Exposure	Probability of Occurrence	Severity of Consequences	Risk Score
journey	avoidable and unnecessary driving is NOT avoided	1	1	2	2
journey	poor scheduling - unrealistic time allowed for trip, inefficient route selection, avoidable delays not eliminated	4	8	8	256
journey	route includes intersections or roads with known high crash frequency; uncontrolled railway crossings	2	6	4	48
journey	poor traction conditions - summer: heavy rain, rain after lengthy hot period	2	8	6	96
journey	poor traction conditions - transition seasons: freeze / thaw cycles, shaded corners, etc.	4	6	6	144
journey	poor traction conditions - winter: snow, ice	6	8	6	288
journey	road surface - rocks, sharp objects or other debris on road, potholes, grooves in pavement, poorly maintained gravel roads	6	8	2	96
journey	extreme temperature conditions - severe heat or cold	6	8	6	288
journey	limited visibility - fog, excessive dust, travelling into sunset or sunrise	6	8	6	288
journey	long duration trips (continuous driving more than 2 hours)	10	8	2	160
journey	unpredictable or irregular schedules, shift work, long shifts	10	8	4	320
journey	drive between midnight and 6:00 a.m.	8	8	6	384
journey	congested traffic - delay, frustration	8	6	4	192
journey	unexpected delays (e.g. road construction, crash or emergency on route) - can cause hurrying	6	8	4	192
journey	no check-in procedure, emergency procedures or communications device	2	6	2	24
journey	backing / reversing	8	8	2	128
Journey	aggressive or high risk driving (failing to yield right of way, passing when unsafe) by others	8	8	4	256
journey	collision with oncoming vehicle (their fault)	2	10	8	160
journey	collision with pedestrian or cyclist	1	10	8	80
journey	collision with farm animals, wildlife	4	10	6	240

Hazard Category	Hazard / Contributing Factor	Frequency of Exposure	Probability of Occurrence	Severity of Consequences	Risk Score
vehicle	vehicle not selected or equipped for use (e.g. under-powered, wrong axle configuration)	2	6	4	48
vehicle	safety features absent or inoperable	8	8	6	384
vehicle	vehicles not regularly inspected	1	2	2	4
vehicle	vehicle not maintained according to manufacturer specifications	1	2	2	4
vehicle	worn or faulty steering components	2	10	4	80
vehicle	faulty brakes	4	8	6	192
vehicle	faulty head lights, tail lights or signals, etc.	4	4	4	64
vehicle	worn or damaged tires	6	8	4	192
vehicle	tires not suited for application (e.g. all-season tires rather than winter tires)	2	10	4	80
vehicle	cracked windshield	4	8	2	64
vehicle	loose wheel nuts	2	8	4	64
vehicle	damaged exhaust system (exhaust leak into cab, risk of carbon monoxide poisoning, diesel particulates)	1	10	2	20
vehicle	improperly adjusted mirrors - visibility	6	8	2	96
vehicle	improperly adjusted seat and headrest - MSI strain, visibility	6	8	2	96
vehicle	sudden release of air pressure from airline	2	6	2	24
vehicle	sudden release of hydraulic pressure (e.g. lift truck, on-board hydraulic equipment)	1	2	2	4
vehicle	vehicle slips off jack during tire change	1	10	2	20
vehicle	prolonged exposure to loud noise - exhaust, equipment	8	8	2	128
vehicle	overloaded, or unbalanced load	6	6	6	216
vehicle	unsecured load	4	6	6	144
vehicle	loose items in cab, disorganized driving workspace	10	10	2	200
vehicle	electrical energy shock (e.g. improper battery boost)	2	10	1	20
vehicle	improper lockout (e.g. vehicle rolls into another vehicle, person)	2	10	4	80
vehicle	vehicle not equipped with appropriate equipment - e.g. winter tire chains, windshield washer fluid	4	10	4	160
vehicle	lack of emergency equipment or first aid supplies - year-round	4	6	2	48
vehicle	lack of winter emergency equipment clothing, blankets, shovel, supplies, etc.	4	6	2	48



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