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Journey Management: A Strategic Approach to Reducing Your Workers' Greatest Risk

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Abstract

Motor vehicle crashes are the leading cause of death for U.S. oil and gas extraction workers; the motor vehicle fatality rate in this industry is 8.5 times higher than for all U.S. workers (Retzer et al., 2013). This may be due to a variety of factors, including long work hours and long distances traveled, often on rural roads which may lack safety features. There are four main strategies for reducing the number of work-related motor vehicle fatalities: 1) reduce the risk of injury by reducing the total amount of travel, 2) substitute the means of travel (e.g., road vs. air), to reduce the level of risk to the worker, 3) reduce the risks for necessary road travel, and 4) reduce crash severity, thereby reducing injury severity.

Journey management is a promising prevention strategy to reduce the total number of miles driven and to reduce the risks associated with road travel. Journey management is accomplished through company policies and procedures that systematically question the need for trips and select the safest routes, driving conditions, drivers, and vehicles for necessary road travel. Many oil and gas companies have implemented a journey management procedure to protect their workers and assets. As a result of the success of journey management, the International Association of Oil & Gas Producers (OGP) recommends that all oil and gas extraction companies implement a journey management procedure as part of an overall land transportation safety program (OGP 2011a). However, the application of journey management is somewhat limited in the U.S. and there appears to be a need for more clarification of journey management and the elements of a journey management procedure.

This paper will define journey management, describe the elements of a journey management procedure, and describe the steps to develop a journey management procedure tailored to your company's driving environment.¹

Introduction

Motor vehicle crashes kill more U.S. oil and gas extraction workers than any other cause (Retzer & Hill, 2011, CDC, 2008). Many factors contribute to this, including driving on rural roads, long work hours, and rugged terrain. Data on work-related deaths do not include workers who die in crashes during commutes to work. Many oil and gas extraction workers have long commutes to their worksite, resulting in additional exposure and risk for crashes. Driving differs in several ways from other types of work performed in this industry. First, it is primarily an unsupervised task. Second, driving is performed in a comparatively uncontrolled environment; the driving 'worksite' is vulnerable to third party drivers. Third, the operating conditions can and do change constantly. The driver must monitor and respond to changes in road conditions, weather, visibility, traffic, and the vehicle. A driver can also be exposed to conditions that are quite manageable at the outset, but may become less manageable within a short period of time. Time constraints imposed by the employer may have an effect and could encourage unsafe driving practices (e.g., speeding).

Although many SPE articles have been published on the success of journey management when implemented alone or in

¹ The findings and conclusions in this paper are those of the authors. They have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

combination with other strategies, there is a paucity of peer-reviewed literature on journey management. A systematic review of SPE articles on oil and gas motor vehicle safety programs identified 19 articles on journey management between 1990 and 2012 (Retzer et al., 2013). All of the articles reported a reduction in crash rates, injury rates, and/or cost savings as a result of the intervention. Professional associations in the United Kingdom and Australia have issued guidelines containing journey management principles (Australasian Fleet Managers Association, 2008; Royal Society for the Prevention of Accidents, 2003; Health and Safety Executive UK, 2003). An Australian researcher (Mitchell et al., 2012) recently published a peer-reviewed article on the development of a fleet safety management audit tool intended to provide a benchmark for fleet safety management performance. Journey management was listed as one of six main categories in the tool. The OGP recommends that all companies develop and implement a journey management procedure (JMP) as part of an overall land transportation safety program (OGP 2011a). However, the application of journey management appears somewhat limited in the U.S. and there may be a need for clarification of journey management and the elements of a JMP.

This paper outlines a definition of journey management, explains the difference between journey management and day-to-day trip management, and outlines suggested steps to develop a journey management procedure tailored to your company's driving environment.

A Definition of Journey Management

Journey management refers to a planned and systematic process of reducing transportation-related risks within a company's operations. The key objective is to minimize unnecessary trips, distances driven and the risks associated with necessary trips. Journey management contains the following components: 1) a formal procedure/policy that requires site-specific assessments of transportation-related hazards and what steps will be taken to minimize these hazards, 2) a formal mechanism to assess the need for trips and to seek to eliminate unnecessary trips, and 3) a procedure for managing trips, including minimizing driving and environmental risks, the distances driven in a single trip, safe route planning, etc.

Distinguishing between Journey Management and Trip Management

Many discussions about journey management focus on only one of the three components of journey management - trip management (#3 listed above). Trip management refers to the day to day process a supervisor and driver follow when planning and making a trip. This includes pre-trip, trip, and post-trip procedures. This may include a pre-trip risk assessment checklist, procedures for checking-in during the trip, when to take rest breaks, and how to report back to a dispatcher or journey manager upon arrival. While journey management includes these trip management procedures, it also takes into account the bigger picture of risks routinely faced by a company's local fleet operations. A journey management procedure describes the routine risks (hazards) and outlines a plan to address those risks, as well as how to assess risk on a trip by trip basis.

A very simple example of an approach to journey management in one's personal life could be looking at your week ahead and timing your shopping trips to coincide with times and streets with low traffic density, and combining trips, such as shopping and dropping off/picking up children from school to lessen travel and reduce the exposure to road hazards. This approach can be applied in a more systematic, comprehensive way in the workplace.

Steps to developing a journey management procedure (JMP)

In this section, we will introduce a suggested step by step process to guide a company through the development of a JMP that is comprehensive and includes controls for all of the hazards faced in their operations.

Step 1. Develop a road safety framework

Before developing a JMP, make sure you have established an overall road safety policy. This will formalize your company's position and expectations with respect to road safety. No program can be truly successful or sustainable without full management leadership, commitment and accountability. Common components of a road safety policy include mandatory use of seatbelts, driving within the bounds of the law, training for all drivers for their assigned vehicle type, and requiring drivers to be alert and fit for duty prior to taking a trip.

Step 2. Determine necessary driving activities

When assessing risk for road transportation operations, the first question asked should be, "Is driving necessary?" All trips should be challenged using this question. In some instances, it may make better sense to use rail or air, which is a safer mode of transport. Consideration should also be given to making better use of public transportation. Also consider using freight forwarders and combining loads with other businesses.

The next question may be, "Is it necessary for my company to do the transporting?" For a service company providing wellsite

or worksite services, a major consideration is whether they will transport their own equipment or leave this to companies dedicated to this activity, such as rig moving companies.

Step 3. Start a risk register

The purpose of a risk register is to identify overall driving exposure. For each activity or job task, write down the hazards or conditions that have the potential to cause a motor vehicle incident. Review your fleet's previous incidents and use input from drivers to help identify these hazards. Lastly, write down the risks or consequences that have occurred or could occur as a result of each hazard. A suggested approach is to divide each activity into the categories below.

Weather: Consider local weather conditions that are hazardous. Some examples include areas that experience fog regularly, roads that may be prone to ice or snow during winter, stretches of roads subject to heavy cross winds, and extreme heat or cold that occurs in the area.

Roads: Complete a road hazard assessment on each of the primary routes your vehicles travel. Assessment tools have been developed that provide a simple yet effective assessment tool: as one person drives the road, a passenger logs road hazards at mileage points (OGP 2011b). The hazard log is then reviewed to provide suggested operating procedures to deal with the identified hazards. The finished assessment is then provided to drivers during training and as part of pre-trip planning. The assessment takes into consideration road surface, traction, sharp curves, etc.

Traffic Conditions: Identify local traffic patterns and behaviors that are hazardous. High-risk intersections and high volume roadways are examples of what should be included. Crash history of major roads may be available through local law enforcement.

Light conditions: Identify local light conditions (caused by sunrise/sunset, absence of lighting, etc.) that are hazardous.

Personal and load security issues: For example, list areas with little or no mobile phone coverage and high crime areas.

Vehicle handling issues: Identify hazards related to each vehicle type in your fleet. Hazards may be related to stability, dimensions, and maintenance/repair concerns. Discuss vehicle types that may require extra knowledge, training and qualification, or added diligence when operated, such as vehicles with a high center of gravity, tri-drive differentials, tandem, triple steering axles, tag axles, etc.

Driver: Identify driver hazards that can result from a lack of experience, training, fitness-for-duty, etc.

Here is an example of a risk register - please note that this is not an exhaustive list:

Risk Register			
Activity	Category	Hazard	Risk
Driving in winter	Road	Slippery roads	Skidding causing crash
	Weather	Extreme cold	Hypothermia in the event of an incident
	Traffic	Other drivers	May travel too fast for conditions and enter driver's lane
	Vehicle	Extreme cold	May cause starting problems
	Driver	High alertness for extreme driving conditions	May lead to driver fatigue causing micro-sleeps

Step 4: Identify controls for risks

Identify the control(s) that your company already has in place to prevent or mitigate each hazard and/or risk, and those that you will need to add. This is called a risk control matrix. The four main categories of controls should be considered. These are hierarchical:

1. Elimination (i.e., removing the hazard completely)
2. Engineering (e.g., electronic stability control)
3. Administrative (e.g., driving restrictions)
4. Personal protection (e.g., seatbelts, airbags)

The risk control matrix is aligned with the general structure of a Job Safety Analysis (JSA).

Risk Control Matrix

Activity	Category	Hazard	Risk	Controls	
				Prevention	Mitigation
Driving in winter	Road	Slippery roads	Loss of steering control leading to crash	<ul style="list-style-type: none"> • Journey management • Reduce speed • In-Vehicle Monitoring Systems • Use 3 peak mountain and snow flake symbol (3PMS) winter tires • Anti-lock braking system (ABS) • Training • Competency assessment • Regulatory compliance, e.g., pre-service inspection 	<ul style="list-style-type: none"> • Seatbelts • In-Vehicle Monitoring Systems • Vehicle design (e.g., NCAP star rating, IIHS ratings) • Electronic Stability Control/ABS • Air bags • First aid training • Cell phones / 911 • Emergency response planning, preparedness and capabilities • Emergency kit in the vehicle (e.g., blankets, water, flashlight, flares, first aid kit)

List all of the controls that you believe should be in place to best manage the hazards encountered by your operations. In doing so, you will give yourself the ability to develop a ‘gap analysis’ or a ‘to do’ list. These can be made part of an action plan to be addressed immediately or over a period of time as part of continuous improvement when resources are available. In all cases, you should strive to develop controls that are practical and that can be implemented and applied consistently.

Step 5. Create a JMP

The next step is to bring the framework, risk register and controls together into one working document, the JMP. Supervisors will use the JMP to manage their transportation activities and drivers will use the JMP to manage their trips. The JMP is also used, where appropriate, by dispatchers and other operations staff for scheduling work flow and personnel. One suggested outline for the sections of a JMP is as follows:

1. Local risk profile

This initial section describes the operating environment and associated hazards. Content for this section should be based on your completed risk register described above in Step 3.

2. Local regulations

List the regulations that apply to the operation of your company’s motor vehicle fleet. While reference can be made to the Federal and State Acts encompassing the operations, you would also want to list County, Municipal or other governances and bylaws that may not be as well known, e.g., vehicle dimension limitations, specific operating authorities, road restrictions, noise restrictions, or idling restrictions.

3. Local policies and procedures

Communicate the local practices and policies that were determined to be needed in your local risk control matrix. Here are some common elements included in this section:

- Scheduling to help ensure drivers have dedicated time for adequate rest to be legal and safe to drive
- Night driving restrictions
- Elimination of distractions
- Route restrictions
- Load securement practices
- Specific training or competence assessments
- Vehicle selection requirements
- Maintenance requirements

- In-vehicle monitoring system settings and data management practices
- Trip management procedure and processes (see trip management)
- Convoy practices; orientation of drivers from other operating locations/regions
- Post collision procedures and emergency response procedures

4. Customer/client policies and procedures

List any specific expectations set forth by your customers or clients. This may include delivery times, loading/unloading rules, and after-hours processes.

5. Contractor management

In this section, reference can be made to:

- Expectations for a contractor's journey management procedure
- Selection and dispatch – preferred vendor list (based on safety performance)
- Limitations of services to be provided by any contractor
- Equipment specification

6. Management of change / exception process

Specify what drivers should do when the rules don't fit the situation. With every set of rules, there will be exceptions. It is best to formalize a process before such a situation arises. For smaller operations, this may simply be a call to the operations manager. For larger corporations or higher risk operations, this may be a more formal process.

If your company has operations in more than one region but operating environments are similar, you may decide to have only one JMP. In other cases, to help minimize confusion, it may be best to individualize JMPs by region and possibly by operating location. The JMP should be as detailed or as simple as it needs to be. Fleet size is not the overarching criterion for how detailed a JMP is, although this will most likely have some bearing. The deciding factors will generally be the complexity of the risk, the degree of the associated liability, and the level of your company's commitment to zero incidents.

Step 6. Manage each trip

Each trip should have a plan associated with it. The steps taken in the plan don't necessarily have to be recorded. You may, however, find that having a documented process within your JMP to be of value for trips having greater risk, for consistency in trip execution and for use in any incident investigations and review.

Pre-Trip considerations

Risk assessment: Assessing risk for an individual trip can vary widely based on the type of trip being performed. It may be as simple as checking the weather and traffic report on the radio or it can be quite sophisticated. Once again, ask, "Is this trip necessary?" Trips may be consolidated or other modes of transport considered that reduce the exposure to your employees. OGP provides an excellent example of a pre-trip risk assessment tool (OGP 2011c). A driver needs to assess conditions at the start of the trip, how they may change during the trip, and also consider the potential conditions for the return trip. The forecast may be such that you need to delay the trip even though conditions at the start are favorable, or plan a waypoint for a stop over.

Trip approval: Each trip should have some form of approval requirement. Local trips around town for parts, etc., may have a blanket approval, whereas trips outside the immediate urban area may require specific and elevating levels of approval, based on the destination, the ambient conditions, the load and the timing of the trip. Basically, the higher the risk of the trip, the higher the level of approval required.

Journey manager: Each trip should have a 'journey manager' assigned. This is a person who, at a minimum, knows which drivers are going where, when and by which route and who is not participating in the journey. The journey manager knows when a driver or convoy is delayed and is responsible for initiating some form of emergency response if a driver fails to reach their destination. Frequently, the journey manager is a dispatcher or operations supervisor.

Convoys: Convoys can be a very effective control mechanism for trip management. They can also, however, create a potential hazard for other road users, especially the impatient ones. The decision to dispatch vehicles in convoy must not be taken lightly and should be reconsidered prior to each trip. In some cases, a large convoy can be dispatched in smaller groups with staggered departure times to ease road congestion.

En route considerations

Drivers should diligently monitor risks throughout a trip and have a set plan for vehicle load securement checks and inspection. The driver should also know their scheduled rest stops, hours of service limitations, and a plan for avoiding distractions while driving. Contingency plans and emergency response plans should be known. What can often start out as a simple trip can deteriorate into an emergency due to poor planning or a lack of situational awareness.

Post trip considerations

Post trip activities are as important as any other stage of a trip and can have a significant effect on subsequent trips. A trip

should be closed out with the journey manager and updates should be given to other drivers of any new or temporary hazardous conditions that may affect them. Road hazard assessments should be updated to include new, more permanent hazards. The vehicle should have a post-trip inspection and notification of any needed vehicle repairs should be made. The vehicle should be in a safe condition to drive prior to the next trip prevent the driver from operating an unsafe vehicle for the sake of expediency. The vehicle should be parked in a secure location for the vehicle as well as the load. The driver should also report any near-misses and know where he will go to obtain maximum restorative rest.

Right of Refusal (Stop the Job)

Every driver should feel capable and confident that they can safely complete the trip. If they do not feel this way at the start or at any point during the trip, they should be allowed the right to refuse to undertake or continue the trip. Contingency for this is a necessary part of any trip management plan.

Step 7. Review your JMP's success

The overall process of journey management needs to be dynamic since the operating environment is constantly changing. You will want to track your incidents in order to measure your JMP's success and make necessary adjustments. The recognized industry standard for measuring and reporting incidents is to calculate a motor vehicle crash rate per 1,000,000 miles or kilometres driven. A definition of this key performance indicator is provided in OGP RP 365 (2011a). In addition to tracking the motor vehicle crash rate, there should be an established process for workers to communicate observed hazards, both driving behaviors and driving conditions, to help heighten safety awareness. This type of reporting can help to prevent incidents and may also lead to an improved safety culture.

Incidents, while unfortunate and undesirable, can provide significant information and feedback on the success of your JMP. Therefore, a review of each incident should be completed and will provide valuable insights into ways to improve your JMP and reduce the probability of further incidents.

Managers/supervisors should periodically check in with workers to ensure there is adequate understanding and effective implementation of the JMP. Asking a few key questions of drivers, operations managers and other employees involved in transportation can be a simple yet effective method. It also may be useful to drive some of the routes and observe drivers in action.

A more formal audit of your JMP could be conducted annually or bi-annually. An independent auditor with experience in journey management may be able to give the most objective assessment. An audit/self-audit tool is available for use or as a reference from OGP (2011a).

Conclusion

The motor vehicle fatality rate is high for this industry and is the leading cause of death. A JMP, in conjunction with a land transportation safety program, has been shown to be a promising approach to reducing exposure and motor vehicle crashes in this industry. Many oil and gas extraction companies, specifically in the U.S., are new to the concept of journey management and do not have a JMP in place.

The National Occupational Research Agenda (NORA) is a partnership program to stimulate innovative research and improve workplace practices in the U.S. Industry, insurance, academia, government and other partners collaborate to identify the most critical issues in workplace safety and health. Because of the oil and gas extraction industry's high motor vehicle fatality rate and the embracing of journey management by this industry and by international professional associations, the NORA Oil and Gas Sector Council Motor Vehicle subcommittee is currently working on a guidance document on journey management for the U.S. oil and gas extraction industry.

In addition, more peer-reviewed literature on the success of journey management is needed. Although journey management is widely accepted within the oil and gas extraction industry, its principles are applicable to all types of fleet operations. The oil and gas extraction industry can have a broad positive influence on road safety in the workplace by sharing its knowledge on journey management with managers and safety professionals in other industries.

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