

General Motors: Achieving and Maintaining World-Class Leadership in Worker Health and Safety in the Automotive Industry

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Preface

This case study describes how GM Canada's Oshawa Truck Assembly Centre achieved significant improvements in safety performance by modifying its overall safety strategy and its approach to safety leadership.

The purpose of this case study is to teach students the importance of having an appropriate approach to health and safety, and treating leadership in safety as an overriding principle of a company's operation.

The approach taken in developing this case study included a review of archival corporate and plant data, including corporate human resources and health and safety policies, documentation on the implemented safety strategies, and historical safety performance indicators and data for the plant. Discussions were also carried out with key plant personnel.

General Motors of Canada was selected for this case study because of its leadership and commitment to safety, and because it had undertaken, and continues to support, projects in which safety issues are particularly salient. General Motors views its success as closely linked to its commitment to safety leadership in the automotive industry.

This case study is organized as follows. First, background is provided on the history, operations and technological developments of GM Canada's Oshawa Truck Assembly Centre. Second, the Centre's safety history is described, including a tracking of the Centre's performance in safety over the last 15 years. Next, the reasons why health and safety management became important at the Centre and the factors that contributed to this recognition are discussed. Then, the approach taken by the Centre management to improve occupational health and safety, and the key elements of the company's health and safety management system and approach are explained. This includes a review of the implementation of General Motors Safety Core Elements and a discussion of its approach to developing a safety culture in the workplace. Next, the improvements in occupational health and safety attained are described, along with accolades and other forms of recognition. Details are given to provide a clear understanding of the company's perspective on health and safety, and how it has influenced the firm's performance, in terms of profitability and workplace health and safety outcomes. Finally, several key lessons learned are summarized and closing remarks are provided.

Questions are provided to promote further thought and discussion, and to encourage the reader to expand on the ideas presented in this case study and to consider other applications. Such activities complement the use of the case study in the classroom.

This case study is suitable for a broad audience including undergraduate and graduate business and engineering students, practicing engineers and technologists, and managers and senior executives. The case study is particularly suited for courses like Occupational Health and Safety Management, Workplace Design and Organizational Behaviour.

The author invites feedback and comments from interested parties and users, so that the case study can be enhanced in the future.

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1. Introduction

It is the mid 1990s and General Motors faces serious challenges regarding health and safety [4]. The corporation's senior leadership decides at that time to take action to improve significantly General Motor's health and safety record, at all of its facilities [4].

One such facility is the General Motors of Canada (GM Canada) Truck Assembly Centre based in Oshawa, Ontario, Canada. Like other General Motors facilities, the Oshawa Truck Assembly Centre is trying in the mid 1990s to address serious occupational health and safety concerns. Senior management has already taken many positive steps, including putting into place all necessary policies regarding health and safety, but the results in terms of improved health and safety are not as successful as desired. To further improve the situation, outside help is sought.

Flash forward to 2007 and the situation is entirely different at the Oshawa Truck Assembly Centre. Injuries, lost days and worker safety concerns are down markedly. In fact, the Centre is receiving accolades for its occupational health and safety performance, and is recognized as a leader in this area in the industry, especially in its approach to managing workplace health and safety.

This case study describes the steps taken and measures implemented by GM Canada's Oshawa Truck Assembly Centre to dramatically improve its safety record, ultimately allowing that Centre to become both a leader and model in the automotive industry for workplace safety.

2. Company Background

The focus for this case study is the GM Canada Truck Assembly Centre located in Oshawa, Ontario, Canada [1-3].

GM Canada, currently the largest automaker in the country, directly employs roughly 15,000 employees in six assembly and components facilities, with an annual production capacity of over 1 million vehicles. It also has responsibility for approximately 765 vehicle dealerships and retail outlets that employ more than 34,000 people from coast to coast. GM Canada is Canada's largest exporter, and manufactures more vehicles in Canada than any other automaker.

The GM Oshawa Autoplex includes two car assembly lines and a truck assembly centre (see Figs. 1 and 2). The facility has 10.4 million square feet of production floor space.

The Oshawa Truck Assembly Centre, within the GM Oshawa Autoplex, opened in 1965 and presently occupies 3.2 million square feet of building space. The Centre was producing over 1300 trucks per day at the time this case study was developed. It is one of six assembly plants in North America building the Chevrolet Silverado and GMC Sierra pickup trucks. The Oshawa Truck Assembly Centre began producing the current generation of trucks from GM Canada (GMT-900 trucks) in October 2006.

Some statistics on the Truck Assembly Centre's operations follow:

- Approximately 20 hours are required to build a truck.
- A truck is comprised of about 2000 parts.

- About 90% of the trucks produced are sent to the U.S., while 10% are sold in Canada.
- 95% of the trucks produced are transported to market by rail and 5% by transport truck.
- At the time this case study was prepared, the Centre had approximately 3700 employees, about 3400 of whom were represented by the Canadian Auto Workers union. The average employee age at the time was about 47.

A partial chronology of the Truck Centre's history and technological developments, which helps provide an appreciation of the facility, follows [1]:

- 1965: The current facility opened, producing heavy-, medium- and light-duty trucks, vans, and school buses.
- 1984: Production of the GMT-400 model truck was awarded to the Centre, accompanied by a \$456 million investment, which allowed the Centre size to double to 2.7 million square feet.
- 1986: Production of GMT-400 trucks began, with both the regular and extended cab models.
- 1989: The short-box extended cab was introduced.
- 1993: The Centre became GM's first three-shift truck operation North America, and daily production of 1166 trucks.
- 1996: Construction began for the GMT-800 truck program, with a corresponding increase in Centre size to 3.1 million square feet.
- 1997: Production changed to three equal shifts, and daily production increased to 1260 vehicles.
- 1998: Production of GMT-800 trucks (Chevrolet Silverado and GMC Sierra) began.
- 1999: GM Canada's 7,000,000th truck was built and daily production increased to 1302 vehicles.
- 2000: Production of the GMC Sierra C3 Luxury Pickup (now called Denali) began.
- 2001: The Quadra-steer option was introduced.
- 2003: The Silverado SS truck was introduced.
- 2004: Production of the light duty crew cab was launched.
- 2006: Production of GMT-900 trucks began.

All aspects of Oshawa Truck Assembly Centre's operation consist of a diverse set of health and safety challenges.

3. Company Safety History and When and Why Safety Became a Crucial Company Issue

To appreciate the steps taken by GM Canada to improve safety, it is instructive to understand when in corporate history health and safety became important and what factors contributed to this recognition.

Given that all aspects of the Oshawa Truck Assembly Centre's operation involve health and safety challenges, efforts had always been made to ensure occupational health and safety is managed properly in the Centre. Senior management had established policies regarding health and safety, and several full-time joint health and safety committees. Safety risks in many areas (e.g., hazardous materials, excessive noise, ergonomic injury) were addressed by these policies and committees. Also, the Centre used new technology and the safest equipment available. In addition, the Centre's management had instituted what they felt were

- good safety procedures and standards,
- good and extensive safety training, and
- good safety talk programs.

Nonetheless, health and safety was a concern in the early 1990s at GM Canada's Oshawa Truck Assembly Centre for a variety of reasons [1]:

- The Centre had a high injury frequency, which had remained stable over a number of years. For example, the annual lost time incident frequency at Oshawa Truck Assembly Centre for 1982-1993 is shown in Fig. 3, where the frequency is seen to be consistently high.
- Workers' compensation costs at the Centre were increasing.
- Workers at the Centre frequently expressed health and safety concerns.

Note that the frequency cited in Fig. 3 and elsewhere throughout this case study is usually normalized on the basis of either 200,000 hours worked or 100 employees per year. These are equivalent, as 200,000 hours is the approximate time worked by 100 full-time employees working 40 hours/week for 50 weeks per year.

Addressing health and safety issues was consequently occupying a significant proportion of the time and attention of Centre management.

Furthermore, the Oshawa Truck Assembly Centre had one of the poorest safety records in the industry. For example, a comparison of lost time incident frequencies for different companies for 1992 (see Fig. 4) showed GM Canada to have a very poor record compared to other automotive and non-automotive companies. That comparison also showed the lost time incident frequency of the Oshawa Truck Assembly Centre to be markedly poorer than that for GM Canada as a whole.

A critical driver for the improvements described in this case study is that in the early 1990s General Motors Corporation was focusing on improving health and safety at all of its operations, on a broad context and scale. Safety became an overriding priority

starting at the very top of the corporation, and a commitment was made to improve health and safety. Leadership-driven culture change efforts at General Motors are outlined well by Simon and Frazee [4].

In addition, new health and safety legislation (Bill 208) was introduced in Ontario in the early 1990s, amending the Ontario Occupational Health and Safety Act and the Workers' Compensation Act. Some of the main changes involved enhancing the requirements of joint health and safety committees for workplaces of more than 20 employees, requiring the preparation of enhanced written occupational safety and health policies, broadening the grounds which allowed workers to refuse to perform unsafe work, and allowing safety committee members to order a work shutdown under certain circumstances. These changes increased labour involvement in health and safety management and increased the emphasis on the partnership between management and workers on health and safety committees.

Additional safety-improvement measures were implemented where it seemed appropriate, and safety improved somewhat over the following few years. But, the improvements were relatively minor, and the safety situation remained problematic overall. The senior managers wanted very much to improve the Centre's health and safety record but could not determine what else to do to improve the situation, so they sought help from outside the company.

4. A Shift in Direction Regarding Safety

Outside help came through General Motors partnering with Dupont, a company which had an excellent track record in health and safety [1]. Four core safety elements (discussed subsequently) used at Dupont were adopted by General Motors. The Canadian Auto Workers were also partners in the introduction of the core safety elements in Canada. This point is important, as a good labour-management partnership increases significantly the likelihood of success in improving health and safety.

In 1998, GM Canada's Oshawa Truck Assembly Centre turned to an outside agency specialized in culture change, which helps companies improve their performance through changes in aspects of their cultures. The agency used by the Truck Assembly Centre has particular expertise in improving safety performance.

The culture change agency reviewed the Centre's safety-related documentation, including policies, procedures and records, and interviewed personnel ranging from workers on the floor to senior managers. To help ascertain how safety is dealt with and viewed across the Centre, the agency carried out a detailed survey of plant personnel. Several important findings flowed from that survey [5], the executive overview for which follows:

Executive Overview of the Oshawa Safety Culture

The Oshawa truck plant, one of General Motors' premier manufacturing facilities, opened in 1965 at its present site. It has earned a well-deserved reputation within the General Motors Truck Division for excellence, both in terms of profitability

and quality, and in 1984 was awarded the GMT 400 Project. This project launched Oshawa into innovative dimensions for engineering, manufacturing and technology to build trucks. It required both managers and hourly workers to change, learn and acquire new skills. Given its success over the years with the GMT 400 project, Oshawa was the logical choice to launch the GMT 800 project, the next generation of full-size pick-ups. Oshawa is a crucial component in the NAO [North American Operations] competitive strategy.

The Oshawa plant has achieved its reputation because managers have the knowledge and the workforce has the ability and skills to build excellent trucks. It has met engineering and manufacturing goals because those goals have been clearly articulated, well thought out, planned and received the fullest attention. Improved technology has enabled Oshawa to produce nearly 1,400 trucks per day, and an experienced workforce is required to optimize this technology.

The Oshawa plant has made progress over the last few years in safety and it has taken many important administrative steps to prevent accidents and injuries. Most people in the plant believe it to be a safe environment. The plant is well maintained and housekeeping is kept up. Safety information is readily available through the posted safe operating procedures. It is agreed by hourly and salaried workers alike that the proper safety equipment is provided. The safety staff is highly rated by management and there is a good working relationship with the union health and safety reps. Faced with an untenable situation of excessive work refusals, a model for administratively addressing employee safety concerns has been developed. This procedure clearly establishes accountability and is backed up by Section 28. The procedure has become a model for the Canadian automotive industry. Lost time accidents have been reduced. Yet, there still remain nearly 600 claims a year and 2,000 monthly visits to first aid.

Safety, from an administrative standpoint has been significantly improved in the Oshawa plant. Policies and procedures have been developed. They have been put in place with the hope that management and employees will follow them. But the reality is that many of the policies and procedures that have been put in place are not followed. Though the administration of safety has been done well, there has been little attention placed on the safety culture of the Oshawa plant. The safety culture score for the plant surveyed in March, 1998 indicated an overall score of 3.21 which can be characterized as a moderately weak safety culture. In safety, the Oshawa plant has not achieved the level of excellence it has achieved in the production and quality of trucks.

The safety culture of Oshawa can best be described as two worlds apart. The overall perspective from management, from first-line supervisors to area managers is that in all, but minor aspects, the safety culture is healthy. Exceedingly healthy. Based on the survey scores, one could readily come to the conclusion that this is, indeed, a culture where "Safety is Our Overriding Priority". In several categories management assesses the plant very well and in some categories the self-assessment is equivalent to scores achieved only by world-class safety facilities. Facilities with far fewer lost time accidents, far fewer

recordables, far fewer ergonomic injuries, far lower workman's compensation costs.

The safety culture of the Oshawa truck plant from the hourly perspective is significantly different than that of management. In fact, it is statistically different on every one of 16 subscales. Where management rates the safety culture moderately positive to excellent, the hourly worker perspective rates it as a weak culture, with some well-meaning individuals and pockets of positivism, but weak nevertheless. It is a perspective that maintains that management cares more about jobs out the door than the safety of the worker on the line. It is a perspective that sees little recognition for safety contributions in the plant and believes that safety performance simply doesn't matter in terms of performance appraisal or promotion. It is a perspective that believes that management places little value on the potential contribution of line workers to improving plant safety. It is a perspective that believes that safety mistakes are more opportunities for blaming than opportunities for learning. It is a perspective that finds safety leadership lacking in being role models, in caring more about safety statistics than people, in failing to communicate safety goals, in being unclear that my safety and my well-being and the safety and well-being of my fellow workers is important. It is a perspective that does not believe that "Safety is Our Overriding Priority".

There are important positive elements which exist within the safety culture perspective of the hourly worker. Hourly workers in the Oshawa plant have a strong belief that accidents are preventable, that the people they work with, work safely and that the safety goals of the plant are achievable. Hourly workers highly value the union safety reps and feel they listen and act on their safety concerns. Hourly workers believe that people are willing to take personal responsibility for their own safety and that people in the plant wear personal safety equipment as required. They acknowledge that the condition of the building and housekeeping demonstrate that the company cares about safety and they largely believe that the information needed to operate safely is available. The majority believe that the company provides the resources necessary to do a job safely. The majority of hourly workers believe that they are not asked to perform operations that are unsafe. There are many strengths within the safety perspective of the hourly worker. One thing that differentiates the Oshawa truck plant from truly excellent safety cultures, is that truly excellent safety cultures tap into the positivism of their hourly workers so that they contribute to the safety of all for the greater good. Few people would maintain, hourly and salaried alike, that that is the case in Oshawa.

The challenge facing the Oshawa truck plant regarding safety is not a set of technological or administrative dilemmas. Giant steps have been taken to address those problems. The challenge is providing the collective leadership for working on the people systems that will maximize the good work that has already been done. The Oshawa plant is at the very beginning stages of dedicating itself to walking the talk of safety. It will require the same intensity, dedication and leadership that has been brought to bear on engineering problems. As with the

launch of the GMT 800 project and the GMT 400 project before it, there must be leadership and unity of purpose. To achieve this alignment, there needs to be a clarity of expectations and commitment about safety within the management team. Only then will the stage be set for the kind of joint leadership that will more effectively tap into the positivism of the hourly workers. These steps will lead the Oshawa plant to achieving a world-class safety culture.

In the above, two definitions are important. A recordable (i.e., recordable injury) is any work-related injury or illness condition requiring greater than superficial first-aid treatment. A lost workday case is any work-related injury or illness condition requiring greater than the balance of the shift time off (usually at least the next full shift or subsequent days off) and associated with an active (open) medical case.

The overall conclusions of the survey report [5] were that

- safety is managed administratively, not culturally, in the Oshawa Truck Assembly Centre,
- significant progress has been made by managing safety administratively, through policies and procedures, and
- the next step needed to improve safety performance is to manage the safety culture by attending to the soft (or people) side of safety, which involves demonstrating caring, dedication and leadership regarding safety, and ensuring safety measures are followed.

The culture change agency felt that the Oshawa Truck Assembly Centre was at the very beginning at managing the safety culture by attending to the soft side of safety, and recommended that effort be made to create a real safety culture at the Centre.

The culture of an organization can be thought of in many ways [6]. A simple explanation is that, while an organization's policies represent the rules of conduct, the culture represents what is *really* done in the organization or its norms. For example, we have speed limits for our roadways (rules), which generally differ from the typical speeds that people actually drive on them (norms). A culture is driven by values, in that people usually behave in ways that they feel are appropriate and acceptable. A culture resists change, so changing a culture is difficult and normally always requires leadership.

Developing a safety culture often requires several years, involves numerous important factors and normally requires several stages [6]:

- To initiate the culture change, leadership needs to be a champion and role model for the desired culture and its new values.
- Then, agreement and consistency from the rest of the management team must be obtained.
- Next, the safety messages need to be communicated effectively to workers and workers need to be given opportunities to participate in the development and improvement of safety systems. This process leads workers to assume proprietorship

for the improved systems and a belief in a personal responsibility for safety. The partnership between labour and management that this process fosters is very important to improving the safety culture.

In line with the objective of implementing a safety culture at the Oshawa Truck Assembly Centre, two broad recommendations were made in the safety culture report [5] to address the problems highlighted:

- Centre management should focus on the central issue of leadership intensity, consistency and unity around safety as a core value. Otherwise inconsistency in safety management occurs, which greatly impedes developing a world-class safety culture.
- Once the management team is unified around safety assumptions and commitment, a culture change process should be infused into safety programs. The Oshawa Truck Assembly Centre's safety culture is perceived as uncaring, run by numbers and not placing a high priority on safety. Excellent safety cultures are caring about people. When the focus is on production rather than worker safety, accidents are often not reported. This results in underlying safety problems not being examined, because managers do not know they are occurring.

To support these broad recommendations, several specific recommendations were made in the safety culture report [5]:

- Plant leadership team should engage mid-level management (supervisors and team leaders) in safety culture leadership dialogues regarding the safety assumptions by which the Centre will be run, including expectations for acceptable risk, consequences of violating safety procedures and responsiveness and feedback on safety requests. It is necessary to eliminate the gap between the official position on safety as presented by senior leaders, and what others in the plant believe, as well as the lack of coherence within management ranks regarding how safety should be managed, as reflected in different expectations, perceptions and assumptions between the supervisors, superintendents and area managers. The leadership dialogues are intended to resolve underlying differences and emerge with a unified leadership view and commitment to managing safety from the point of view of a common management culture. Also, the leadership dialogues need to institute a system that ensures the safety values and beliefs desired by upper management are communicated to the workforce.
- A safety culture change guidance team should be created to plan the strategy over the full-course of the three to five year safety culture change process, in part by examining the safety culture survey findings and developing projects to build on strengths and remediate the culture's deficiencies. The team should lead the culture change effort, develop a long-term culture change implementation plan and make it a business initiative. An aim within the culture should be to attain Centre safety goals. The team should empower grassroots teams to develop action items to address the culture survey weaknesses from a front-line perspective. The team should include the Centre manager, staff and supervisor representatives and union leaders, and meet for one to two hours biweekly.

- A short-term, cross-functional group should be formed to examine current safety meetings and recommend ways to improve them. Where necessary, safety policies and/or supervisory practices should be changed.
- Safety teams should be established within the skilled trades to increase employee involvement in safety, thereby engendering employee safety ownership and using the knowledge of the people doing the work to improve safety. The teams should be able to develop departmental improvements and work with management to gain approval for and implement recommendations. The teams should focus on improving communication about safety concerns and responses, making safety part of the daily routine, recommending improvements for safety meetings and programs, instituting “culture change” projects, such as sharing near misses or changing safety norms, as well as physical projects, and removing obstacles to cooperation in safety matters between workers, departments, shifts, etc.
- A small group of supervisors should form a short-term task team to evaluate if safety contacts are made regularly and, if so, to determine the quality of the “I care” message being delivered. This task team should make recommendations for improvements.
- A task team should be formed to develop ways to present and explain the survey findings to all Centre employees and to indicate that it is being acted upon. This serves to educate people, raise awareness and demonstrate important changes are occurring in current practice.
- The reporting of accident, injury and illness data should be modified so managers see it as useful for determining where to place their energies on a department-by-department basis.
- Upstream safety process should be measured, not just injury rates, to establish a new safety norm to reverse the perception that management cares more for numbers than individuals. This task can include an annual safety culture perception survey which is used to improve the culture’s weak areas and to ensure progress on the soft (people) side of safety. Introducing metrics that focus on leading in addition to lagging indicators facilitates proactive, long-term planning of preventive actions necessary in a positive safety culture.
- The Safety Department’s roles and responsibilities should be better defined and ensure they are clearly distinct from line management roles and safety responsibilities, with the intent of ensuring safety is clearly a responsibility and priority where the work is done.
- Safety data should be made available visibly, showing areas where injuries occur and the types of injuries, in order to draw attention to safety, foster discussion of possible improvements and demonstrate management’s commitment to safety.
- Communication objectives for management and supervisors should be established that focus on communicating clearly safety goals, indicating concern about safety and

not just numbers, the measuring safety parameters for benchmarking and improvement, and modeling appropriate behavior regarding safety.

5. Approach Taken to Improve Occupational Health and Safety

The recommendations cited above were adopted in ways appropriate to the Oshawa Truck Assembly Centre.

A visible shift in the way health and safety are handled was consequently initiated:

- The Centre's leadership adopted safety as an overriding principle in its operations and made this message clear to all employees, and that leadership would be by example. It was recognized that leading by example involves being highly visible and engaging the workforce, and can not be done by delegation.
- Before changing its safety culture, improving safety focused mainly on engineering solutions and/or operator training. Safety was not viewed as a #1 priority. Individuals and groups in the organization felt that safety is their responsibility or job. Consequently, shortcuts occurred in operations, even when they compromised safety. The view of individuals was that accidents won't happen to them.
- To change the safety culture, an "I care" message was conveyed. Associated with this caring approach, other new messages were transmitted like "safety is everyone's responsibility" and "do the job, but do it safely." The focus shifted from technical and training fixes to improved safety culture and management systems. The culture change was driven from the top, with leadership involvement clearly visible throughout.

In approaching the implementation of a culture change regarding safety, two significant guiding principles, or "absolutes," were adopted by the Oshawa Truck Assembly Centre:

- Safety is the overriding priority.
- All accidents can be prevented (or all incidents are preventable).

These foundation principles are included throughout the Centre's health and safety documents and other communications. Note that the latter point does not imply that all health and safety risks and hazards can be eliminated, even though many can be eliminated, reduced or controlled, but rather that all injuries resulting from the risks and hazards can be eliminated.

Built upon this foundation are five core health and safety leadership elements (a plant safety review board and plant safety committees, safety observation tours, incident investigations, safe operating practices and an employee safety concern process). The five core safety elements are described in the next section.

Built upon the five core leadership elements are twenty-two health and safety requirements. The include visitor safety orientation, plant emergency plan, awareness and communication, injury/illness analysis, hazard communication, leadership responsibilities, confined space entry procedure, lockout program/electrical safe work

practices, ergonomics, construction contractor safety, noise control/hearing conservation, fire hazard control, plant vehicle operation safety, aerial lifts/elevating devices, asbestos safety program, crane and hoist inspections/sling rigging, design-in safety, hand and portable tools, industrial hygiene program, joint health and safety training, material storing/stacking requirements, and rail car and truck dock procedures.

A key additional measure taken was to change the mentality that only the Safety Department was responsible for health and safety so that health and safety became owned and embraced by the departments that do the work, such as manufacturing.

Another key step taken was to introduce goals for health and safety improvement, by corporate mandate. For instance, the following goal was set for the Oshawa Truck Assembly Centre: a 50% reduction in lost time injuries and “recordable” injuries every three years. Correspondingly, leadership is held accountable for safety performance.

6. Key Elements of the Company’s Health and Safety Management System and Approach

At GM Canada, industry leadership in safety is the overriding priority. The Oshawa Truck Assembly Centre promotes this philosophy by encouraging a positive culture for safety for all employees in the workplace.

The health and safety policies of GM Canada and the Oshawa Truck Assembly Centre provide a solid framework for the priority given to health and safety. GM Canada has the following occupational health and safety policy [7]:

*The creation and maintenance of a safe and healthy workplace is the **overriding priority** for the company, and it must be a **shared responsibility** of management and employees.*

*It is incumbent upon management to continuously foster awareness and appreciation among all employees of the importance of pursuing safe and healthy practices. **Management's responsibility** is to provide the proper processes, equipment, tools, facilities, training, and support to ensure that employees can do their jobs safely.*

*It is the **employees' responsibility** to provide for their personal safety by having a thorough knowledge and understanding of the job, and using the processes, equipment and tools in the proper manner at all times.*

The General Motors of Canada Limited health and safety business plan is designed to ensure the health and safety of all employees.

The Oshawa Truck Assembly Centre has the following safety policy [8]:

The Oshawa Truck Assembly Centre is committed to the Health and Safety of its employees and will make every effort to provide a safe and healthy work environment. In fulfilling this commitment the Oshawa Truck Assembly Centre will:

- *Adhere to the General Motors of Canada Limited Occupational Health and Safety Policy.*

- *Provide a safe work environment through effective design, maintenance and training.*
- *Comply with the requirements of the Ontario Occupational Health and Safety Act and regulations.*

Every worker must protect their own health and safety by working in compliance with the Health and Safety legislation and safe work practices established by the company.

The Centre operates under five core safety elements, which common to all General Motors facilities and which are described below [1-3].

6.1. Plant Safety Review Board and Plant Safety Committees

The Plant Safety Review Board is a steering committee comprised of cross-functional plant leadership which leads the health and safety initiative. The Board is led by the Plant Manager and union leadership (as appropriate) and includes the Plant Manager's staff (direct reports), the Plant Safety Manager and union representatives (as appropriate). The purpose of the Board is to support the Plant Manager and union leadership (as appropriate) in jointly managing health and safety.

Each Plant Safety Review Board is required to meet at least monthly. The Plant Manager and union leadership (as appropriate) lead each Board meeting; delegation of this role is prohibited. The Board's meeting agendas follow a common format, with certain standard committees reporting. The Board meetings are not permitted to be diluted by non-safety discussions. The meeting times are treated as "sacred," and the meeting minutes are posted in the plant for public viewing.

Although the agenda can be augmented with a different focus topic each month, there are several required standard agenda items:

- Open issues from the last meeting.
- Review of the plant's top three to five health and safety issues.
- Review of the plant's health and safety performance metrics.
- Reports on special projects and from standing and ad hoc committees (e.g., joint health and safety, ergonomics, fall hazard control, hazardous materials control, noise control, health and safety training).

6.2. Safety Observation Tours

A Safety Observation Tour is an activity in which a leader walks through a specific plant area to collect information and initiate health and safety-oriented conversations with employees. The objectives include:

- Observe and reinforce positive safety behaviors.

- Engage employees in conversations about working safely, covering such topics as their perceptions of the risks associated with their jobs, their understanding of safe work methods and requirements, and their input and suggestions about safety issues.
- Provide corrective feedback for negative safety behaviors.
- Educate employees about health and safety as needed.
- Identify health and safety risks for elimination/mitigation.
- Validate health and safety performance data (i.e., compare reports with real-life observation).

Typical criteria examined during a Tour include use and adequacy of personal protection equipment (PPE), employee position and movements during tasks, tools and equipment used, use and adequacy of work procedures, and cleanliness and orderliness of the work area.

Most of a Safety Observation Tour must be spent in conversation with employees.

Plant Managers are responsible for ensuring that Tours are conducted regularly (monthly for Plant Manager and union leadership, twice monthly for Area Managers, weekly for the Safety Department and weekly for Supervisors/Team Leaders and union representatives). Both scheduled/announced and unscheduled/unannounced Safety Observation Tours should be conducted.

Some considerations regarding Safety Observation Tours follow:

- Other leaders and employees should be invited to join the Tours.
- Scheduled Safety Observation Tours should be treated as “sacred” and efforts should be made to avoid rescheduling them if at all possible.
- Appropriate follow up should occur for every issue identified by employees during a Tour.
- A written report for each Tour should be filed by leaders, and these reports can be posted in the plant for public viewing.

6.3. Incident Investigations

An Incident Investigation is a common process that is completed each time a workplace injury, illness, near miss, or safety-related incident occurs. The objective of an Incident Investigation is to document and analyze the incident so that all immediate risks can be identified, evaluated and controlled, and the root cause(s) can be identified and either eliminated or mitigated.

An Incident Investigation involves the following steps:

- Ensure that injured employees receive proper medical care.
- Secure the accident scene and determine the investigation scope.

- Notify appropriate personnel as needed.
- Gather all required information and release the incident scene.
- Analyze the information using the “Five Whys” problem-solving process to determine the root cause(s) of incidents for corrective action implementation. The Five Whys approach involves repeatedly asking the question “why” (five is a good rule of thumb) to peel away the layers of symptoms which can lead to the root cause of a problem.
- Determine a solution for eliminating or controlling the root cause(s).
- If applicable, review the risk assessment/ Safe Operating Practice in light of the incident.
- Compile and communicate the incident investigation report.
- Implement appropriate follow-up to ensure that the countermeasures are completed.

Incident Investigations have several requirements relating to communications and timing:

- Supervisors or team leaders must conduct a preliminary review of all incidents before their shift ends.
- Plant Managers must tour the scene of all lost workday cases or serious near-miss incidents within 24 hours of the incident.
- Plant Managers must review investigation reports for all lost workday cases.
- Lost workday case reports must be forwarded to Divisional Safety and Manufacturing Managers within 48 hours.
- A review is carried out by GM Canada's senior leadership if the situation is deemed sufficiently serious.
- The leadership chain up through GM's Automotive Strategy Board must be notified within two hours and must receive a written report within 24 hours when a fatality occurs.

Some other considerations regarding Incident Investigations follow:

- The common process satisfies GM's corporate requirements for incident investigations, but there may be additional local requirements to be followed.
- The hierarchy of health and safety controls (see Fig. 5) should be used to determine how best to minimize all root causes identified. That hierarchy indicates that it is best to deal first with root causes, which tend to be systemic, and to work up towards dealing with symptoms of health and safety problems, which tends to be a reactive approach.
- Communication of incidents usually includes a preliminary report (e-mail), a formal Incident Report and an incident bulletin (with photos if appropriate).

- For fatalities, a post-investigation presentation is also usually included.
- It should be ensured that all controls are fully implemented.

An incident report contains several standard sections:

- Incident classification (i.e., near miss, recordable incident, lost work day case).
- Report status (i.e., preliminary report, final report).
- Employee information (i.e., name, department, regular job classification, identification number, supervisor name, location and name of facility where employee was treated, name of person who treated employee).
- Problem identification (i.e., description of task employee was assigned to perform, length of time employee has been performing the task, written standard procedures available for the task, incident description including resulting injuries and treatment).
- Problem solving (i.e., factual problem description, problem analysis using the five whys, possible root cause(s), planned solution(s), solution implementation details and closure tracking, solution evaluation). Other problem solving tools may be used in addition to the Five Whys review depending on need and the depth of the analysis.

For reporting injuries, General Motors follows OSHA standard 29 CFR Part 1904, entitled "Recording and Reporting Occupational Injuries and Illnesses." OSHA (the Occupational Safety & Health Administration) is part of the U.S. Department of Labor. Details on this standard can be found on the OSHA web site (<http://www.osha.gov>). Note that CFR denotes Code of Federal Regulations. For identification of injuries, General Motors follows standards of the American National Standards Institute (ANSI), for which further information is available at <http://www.ansi.org>.

6.4. Safe Operating Practices

Safe Operating Practices are standardized health and safety work instructions, which explain the safe way to perform a work-related tasks based on risk assessments and which are implemented for jobs where risks to employees warrant. The objective of Safe Operating Practices is to eliminate confusion and provide clear, specific guidance about how to perform work safely.

Some requirements regarding Safe Operating Practices follow:

- Plant Managers are responsible for ensuring that Safe Operating Practices contain current information, and are exclusively and consistently used.
- Safe Operating Practices must be posted or made available in or near the area where the task is performed.
- Any employee assigned to perform a task documented in a Safe Operating Practice must be trained using the Practice prior to beginning the task.

- Any employee found working out of compliance to a Safe Operating Practice must immediately be approached and receive feedback.
- All Safe Operating Practices should be based on a suitable risk assessment.

Also Safe Operating Practices should be:

- created and maintained by supervisors and workers with input from subject matter experts (usually employees who know the safest way to perform the task and sometimes additional technical experts).
- validated and approved by leadership before being posted and implemented.
- as visual as possible, including colors and photographs or diagrams where appropriate.
- reviewed in conjunction with the incident investigation following an incident, along with the relevant risk assessment.

Standard elements of a Safe Operating Practice normally include a title, the person responsible for its creation/maintenance, the Safe Operating Practice creation/revision date, required Personal Protective Equipment (PPE), the risk assessment for the task, required steps, prohibited actions, and photograph or diagram as appropriate. An example of a safe operating practice posting at General Motors is shown in Fig. 6.

6.5. Employee Safety Concern Process

The Employee Safety Concern Process is a common process for encouraging and tracking input from employees and management actions on health and safety issues. Its purpose is to provide a formal mechanism for documenting, analyzing, and addressing health and safety input from an invaluable source: employees.

The process requires that:

- Leadership provides a mechanism for getting input/concerns from employees
- Leadership provides a process for capturing, documenting and tracking the input/concern to resolution.
- Leadership makes this process visible through posting.
- Leadership manages accountability for follow-up on open items setting time limits and providing for elevation to a higher level as needed (e.g., employee concerns not resolved within seven days are reviewed at operational meetings, while those not resolved within 30 days are reviewed at Plant Safety Review Board meetings).
- Items stay visible/open until resolved.
- Employees are involved with closing items.

This process is not allowed to interfere with employee rights under applicable union agreements.

7. Resulting Improvements in Health and Safety at the Centre

The change in health and safety management emphasis at the Oshawa Truck Assembly Centre led to improvements in several measurable parameters, including increases in profitability and reductions in health and safety incidents [1, 9].

The new approach to health and safety management led to significant clearly measurable improvements at the Oshawa Truck Assembly Centre. The Centre experienced a significant decrease over the period 1994 to 2006 in its lost work day case rate (see Fig. 7) and total recordables rate (see Fig. 8). Those figures show the monthly and annual rates, as well as the goals set by the Centre and the benchmark being sought for world class leadership.

The impact of introducing health and safety measures and the value of strong and consistent communications can be seen in these figures, by considering the following chronology of events:

- September 1995: Employee Safety Concern Process introduced.
- December 1996: Supervisor knowledge folders introduced. These provide each supervisor with a single folder containing all pertinent information related to health and safety and its management.
- May 1997: First aid run charts introduced. These allow health and safety issues to be raised, tracked and resolved so they do not lead to accidents. The procedure is structured similarly to the quality defect investigation and management process used in production both for familiarity and to facilitate responsibility for safety being adopted by production units.
- March 1998: Core element training began.
- August 1998: Culture change workshops were held.
- November 1998: Safe operating practices introduced for all production jobs.
- 1998: A common communication process was introduced for all North American plants, involving robust processes for communicating directives from senior management throughout all plants and for all other internal communications. This communication process helped ensure health and safety related information was transmitted effectively and received in a timely manner.
- June 1999: Video-based safety talks introduced.
- January 2000: Safety gate process introduced. This process involves supervisors meeting weekly to discuss health and safety issues and how they are being addressed. The procedure is structured similarly to the quality gates used in production, which involve weekly quality group meetings, to promote production units taking responsibility for safety.

- October 2000: Layered safety observation tours introduced.
- February 2001: Global manufacturing system (GMS) layout review process introduced. The global manufacturing system was introduced to increase productivity and reduce waste, but often led to employee concerns, safety issues and other difficulties when a specific new measure rolled out. The new review process required that the measure be reviewed by production operators, union representatives and safety department personnel at least ten days prior to its introduction. By involving these personnel in the process, most potential health and safety concerns and incidents related to the new measure were avoided.
- January 2002: Improved material handling initiatives introduced.
- March 2003: Employee Safety Concern Process revised. The revisions involved requiring that the person who raised the concern be consulted about the resolution and agreeing to it prior to the issue being closed, and the introduction of electronic communications tools to streamline the process.
- January 2004: Plant safety committees restructured.
- February 2004: Employee Safety Concern Process adopted as a fifth core safety element by General Motors.
- January 2005: Daily safety observation tours begun.
- June 2005: Orange Crush certification received for the establishment of Orange Crush zones. These zones remind employees of high-risk areas through the prominent display of an Orange Crush logo in the area. This innovative safety initiative was taken in partnership with Nestle.

Figures 7 and 8 highlight some important results, which can be seen in the following:

- For lost work day cases (per 100 employees), the Centre's 2006 objective was 0.15 and its actual value as of May 2006 was 0.19. The objective for world-class leadership (interpreted by General Motors to be the value attained by Alcoa) is 0.10.
- For total recordables (per 100 employees), the Centre's 2006 objective was 1.39 and its actual value as of May 2006 was 1.68. The objective for world-class leadership (interpreted by General Motors to be the value attained by Alcoa) is 1.44.

Some other benefits of the new approach to safety were also evident:

- Worker compensation costs at the Oshawa Complex (including the Oshawa Truck Assembly Centre) decreased significantly between 1992 and 1999, dropping by about 70%. Some of those savings are attributable to reductions in the size of the workforce, but improved safety management also contributed. Since 1992 the Oshawa Truck Assembly Centre has received significant financial rebates relating to worker compensation.
- The annual number of work refusals at the Oshawa Truck Assembly Centre decreased very significantly between 1996 and 2006, dropping by over 98%. This result built on the improvement already achieved over the period 1989 to 1996, when work refusals decreased by over 60%.

Some key recent health and safety accomplishments by the Oshawa Truck Assembly Centre as of the time this case study was prepared follow:

- The Centre recently achieved its longest period without a lost time incident (5.04 million hours between June 2006 and March 2007).
- The Centre has achieved a 73% improvement in its recordables rate since 2000. The lowest annual recordable rate achieved was 1.53 per 100 employees (in September 2005).
- The Centre has achieved an 80% improvement in its lost work day rate since 2000. The lowest annual lost work day case rate achieved was 0.06 per 100 employees (in May 2005).

The improved safety performance of General Motors and GM Canada relative to other automotive companies has become clearly evident over the last several years:

- Among GM's Ontario automotive assembly plants, a comparison of the incident rate for 2002 (see Fig. 9) shows that GM Canada plants have achieved low incident rates, and that the Oshawa Truck Assembly Centre has the lowest incident rate of all.
- A comparison for different companies for 2002 of the frequencies of recordables (see Fig. 10) and lost work days (see Fig. 11) shows that General Motors and its main global geographic units have much better safety records than the North American operations of other automotive companies. The frequencies of recordables and lost work days are seen to be approaching the levels of world-leading companies. Nevertheless, there appears to be room for further improvement based on the levels attained by world-leading companies.

According to Mr. John Stroyan, Safety Supervisor of GM Canada's Oshawa Truck Assembly Centre, the Centre found that efforts to improve health and safety also resulted in financial benefits. The Centre recognized considerable savings due to health and safety measures, both through Workplace Safety and Insurance Board (WSIB) rebates and avoided costs associated with work refusals) for the decade 1996-2006 compared with the decade of 1986-1996. For instance, annual worker compensation costs decreased by about 70% between 1992 and 1999 at the Oshawa Complex (including the Oshawa Truck Assembly Centre). Very little money was spent, as most of the changes involved changing culture. Mr. Stroyan stated that the results indicate that "safety makes good business sense."

Safety also affects quality and vice versa, according to GM Canada. If a part does not fit properly, it creates the potential to cause injuries for assembly workers or users of the vehicle. Also, when workers are not completely healthy, quality can suffer.

The changes in the approach to health and safety at the Oshawa Truck Assembly Centre also led to other benefits that are less clearly or easily quantified. They include:

- improved employee morale, from employees feeling that the company places a real concern and priority on health and safety, that they are being involved in decisions regarding health and safety, and that their knowledge is respected, valued and

utilized to improve health and safety. Improved employee morale is indirectly evident in the improvement in measures like work refusals.

- an enhanced corporate image, by being able to claim leadership in safety in addition to other corporate leadership attributes like quality and cost.
- an enhanced reputation among other automotive and non-automotive companies regarding the safety leadership of General Motors, GM Canada and the Oshawa Truck Assembly Centre.

These observations are in large part based on opinions, as direct measures of these benefits are not available.

World-class safety performance has been achieved by the Oshawa Truck Assembly Centre since 2000. The Centre is the top plant among GM truck assembly centres and sets the auto industry benchmark for safety performance in Canada. The commitment to safety leadership by the Oshawa Truck Assembly Centre is perhaps most evident by the fact that safety features prominently in its overall mission statement: “Working together in the pursuit of safety, cost and quality excellence to exceed our customer’s expectations.” Clearly, General Motors views its overall success as linked to its commitment to safety leadership in the automotive industry.

8. Accolades and Recognition

Regulatory agencies and Industry Associations have all identified the Oshawa Truck Assembly Centre as one of the safest automotive plants in Canada. The Oshawa Truck Assembly Centre has also achieved the lowest lost time incident rate in Ontario in the automotive industry for the past three years in a row. According to the U.S. National Safety Council, the Oshawa Truck Assembly Centre is world class in safety and is in the top 10% of its industry [9].

Some other examples of the many safety accolades and honours garnered by the Oshawa Truck Assembly Centre follow [1]:

- The Centre received the Chairman’s Honours Award in 2003 for Safety Excellence within General Motors.
- The Centre has received several honours and awards from the National Safety Council, including a Green Cross for Safety Excellence (2000 through 2005), a Significant Improvement Award (2002, 2004), a Certificate of Merit Award – Program Innovation for its Employee Safety Concern Process (2004), and Certificate of Merit Award – Program Innovation for its Orange Crush Process (2004).
- The Centre was recognized in 2005 by *Autoplant* magazine as the “Safest Automotive Plant in North America.”

The practices at the Oshawa Truck Assembly Centre have been so successful that they are being shared with other GM facilities, other automotive companies, and non-automotive companies.

9. Key Lessons

Some of the key lessons learned through the change in approach to health and safety at the Oshawa Truck Assembly Centre are provided here.

In addition to administering safety through policies and procedures, it is necessary to establish a safety culture to achieve world-class performance levels. Appropriate policies and procedures are required, but health and safety problems can persist if they are not accompanied by a safety culture.

It was important to walk the talk regarding health and safety. That is, “You get the level of safety performance that you demonstrate you want.”

Several key steps can go far towards implementing a safety culture and building a commitment to health and safety throughout an organization. At the Oshawa Truck Assembly Centre, some of the key steps included:

- make the core safety leadership elements “sacred,”
- get everyone involved,
- develop a risk-reduction mindset,
- encourage feedback, and
- be consistent.

Finally, the effort put forward to improve health and safety can lead to many benefits, including reductions in accidents and injuries, associated cost savings, and less quantifiable savings such as improved employee morale, reputation and corporate image.

10. Closing Remarks

This case study provides insight into how GM Canada’s Oshawa Truck Assembly Centre developed its reputation as an example for other companies in the industry regarding occupational health and safety. It is hoped that the case study can help others learn the lessons of the Oshawa Truck Assembly Centre, and thereby assist them in improving the health and safety performance records of their own organizations.

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Questions for Discussion

1. List what you feel were the four most important changes regarding health and safety made at the Oshawa Truck Assembly Centre in the mid 1990s, from most to least important. Explain your rationale for the list.
2. Was the approach taken to improve health and safety at the Oshawa Truck Assembly Centre a top down or bottom up approach? Explain your rationale.
3. Summarize the benefits gained for the investments made in health and safety at the Oshawa Truck Assembly Centre. Assess whether the benefits were worthwhile in terms of a) financial considerations only and b) all considerations.
4. Investigate the health and safety management methods at another company, and determine if any or all of the five core safety elements are used (even if they are in a modified form). If they are not all used, do you feel that the company would benefit from adding the missing core elements?
5. The Employee Safety Concern Process was added as a core element some time after the other elements were adopted. Some feel that the Employee Safety Concern Process should not have been adopted because it can be abused by employees. In particular, it can promote numerous frivolous claims of concerns, creating unnecessary work in addressing the claims. What are your views of the merit of the Employee Safety Concern Process?

6. What more does GM Canada need to do to move towards an injury free work environment and to achieve the leading safety performance levels shown in Figs. 10 and 11?

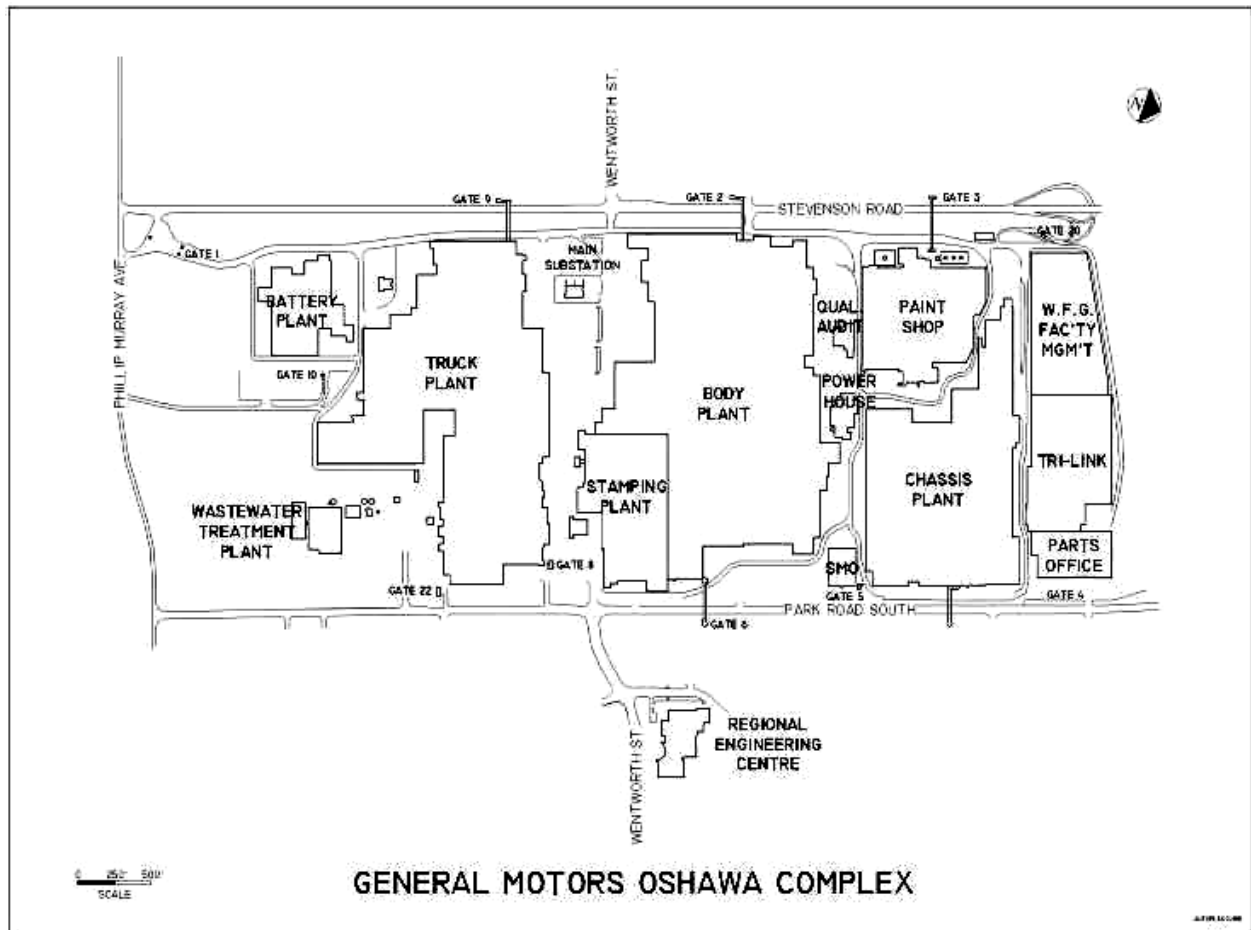


Fig. 1. General Motors Oshawa Complex, at the time of the case study.



Fig. 2. Aerial view of General Motors Oshawa Complex.

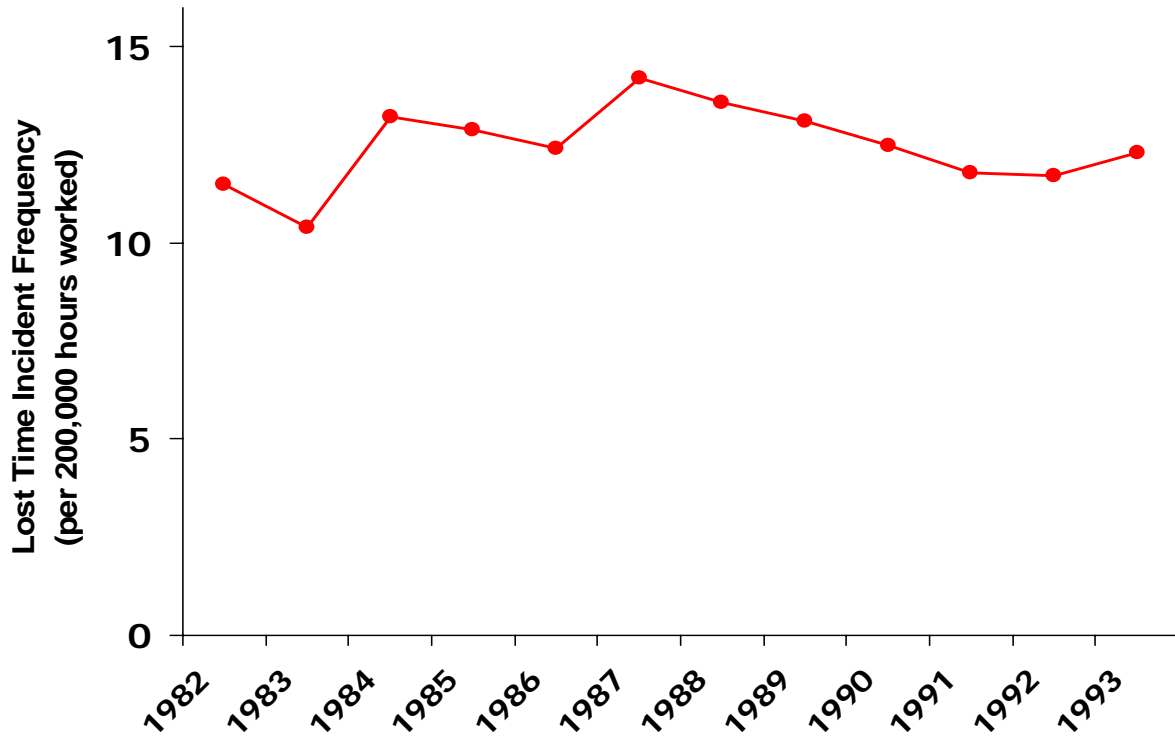


Fig. 3. Annual lost time incident frequency at Oshawa Truck Assembly Centre for 1982-1993.

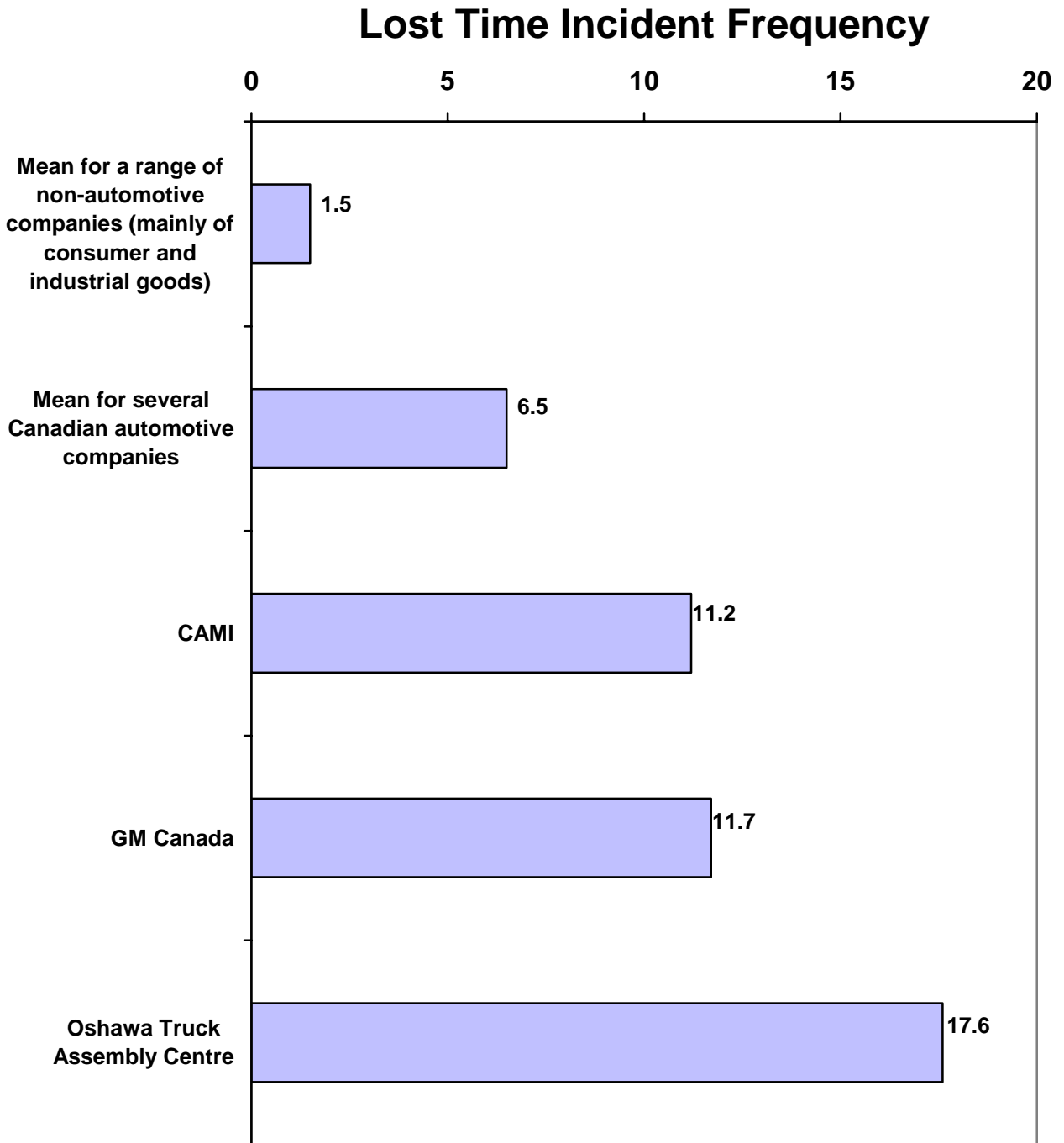


Fig. 4. Comparison of lost time incident frequencies (per 200,000 hours worked) for different companies for 1992.

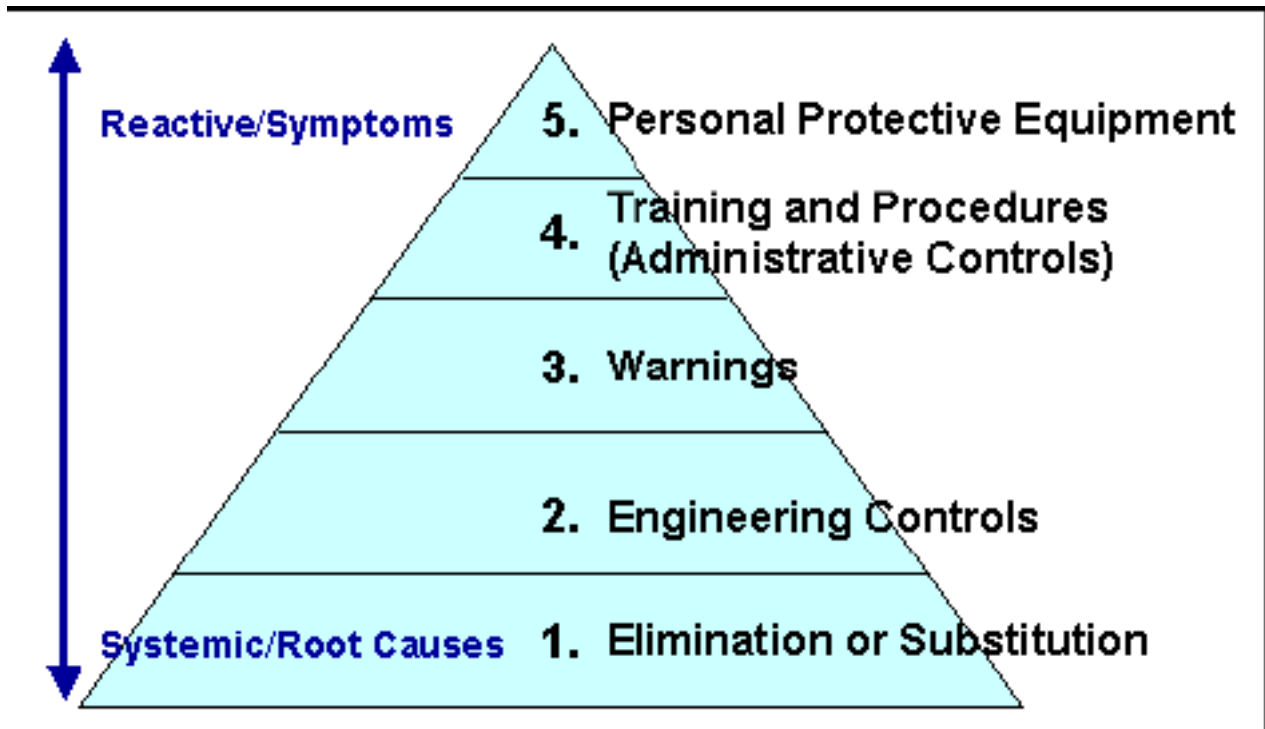


Fig. 5. Hierarchy of health and safety controls used at General Motors.

SAFE OPERATING PRACTICE

Area: Woodshop
Supervisor: Dale Knowles
Revised Date: 15April 2003

Band Saw

- **Safety Glasses**
- **Hearing Protection**



SAFE OPERATING PROCEDURE:

- 1. No Gloves or Jewelry**
- 2. No Loose Items on Work Surface**
- 3. Properly Tighten Blade and Clamps**
- 4. Remove Trip Hazards from Area**
- 5. Restrain/Protect Electrical Cord from Cutting**
- 6. Avoid Distractions**
- 7. Keep Fingers Away from Blade**
- 8. Use Proper Blade for Material**
- 9. Avoid Breathing Dust**

Fig. 6. Example of a safe operating practice posting at General Motors.

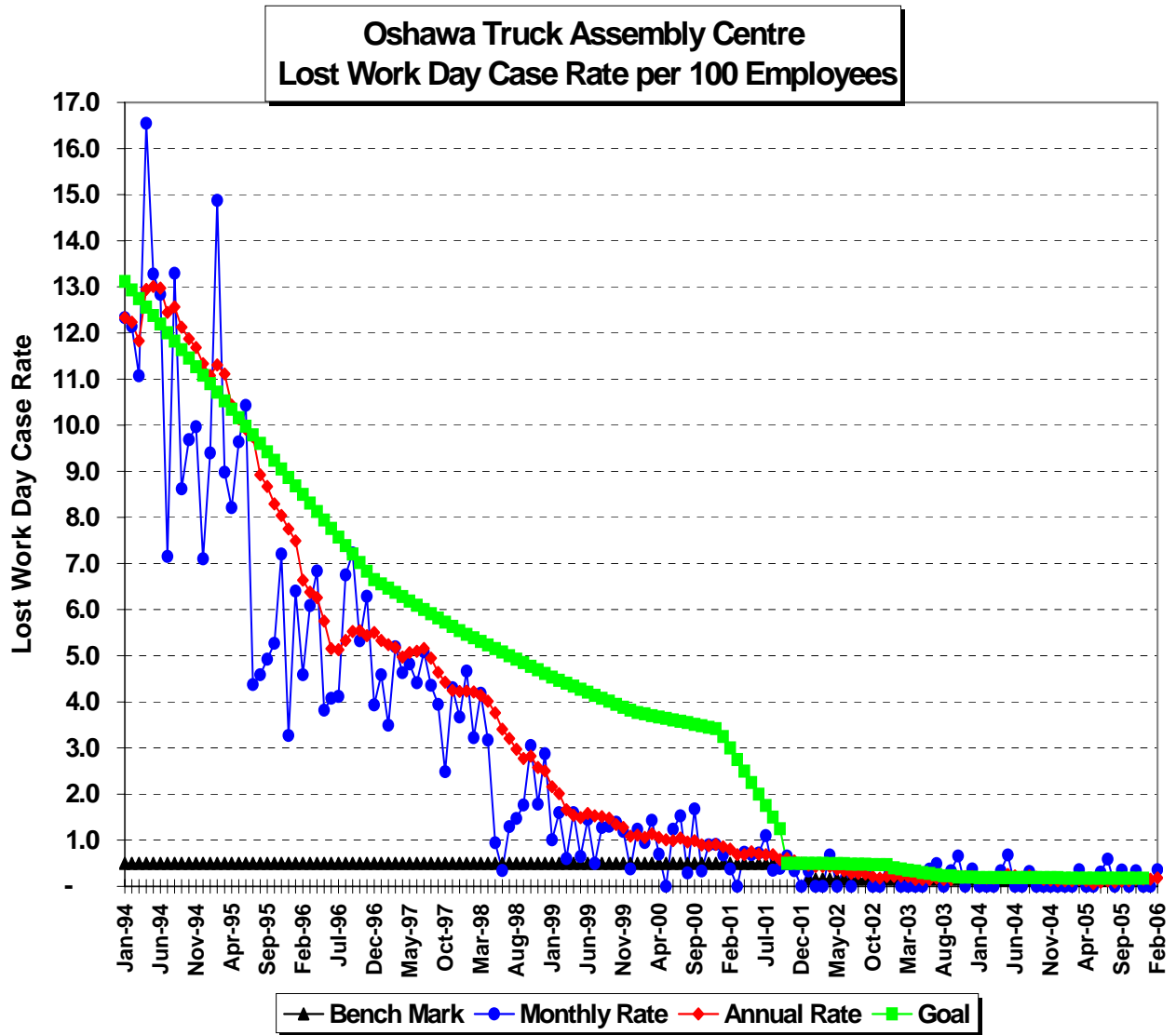


Fig. 7. Lost work day case rate per 100 employees at the Oshawa Truck Assembly Centre for 1994-2006.

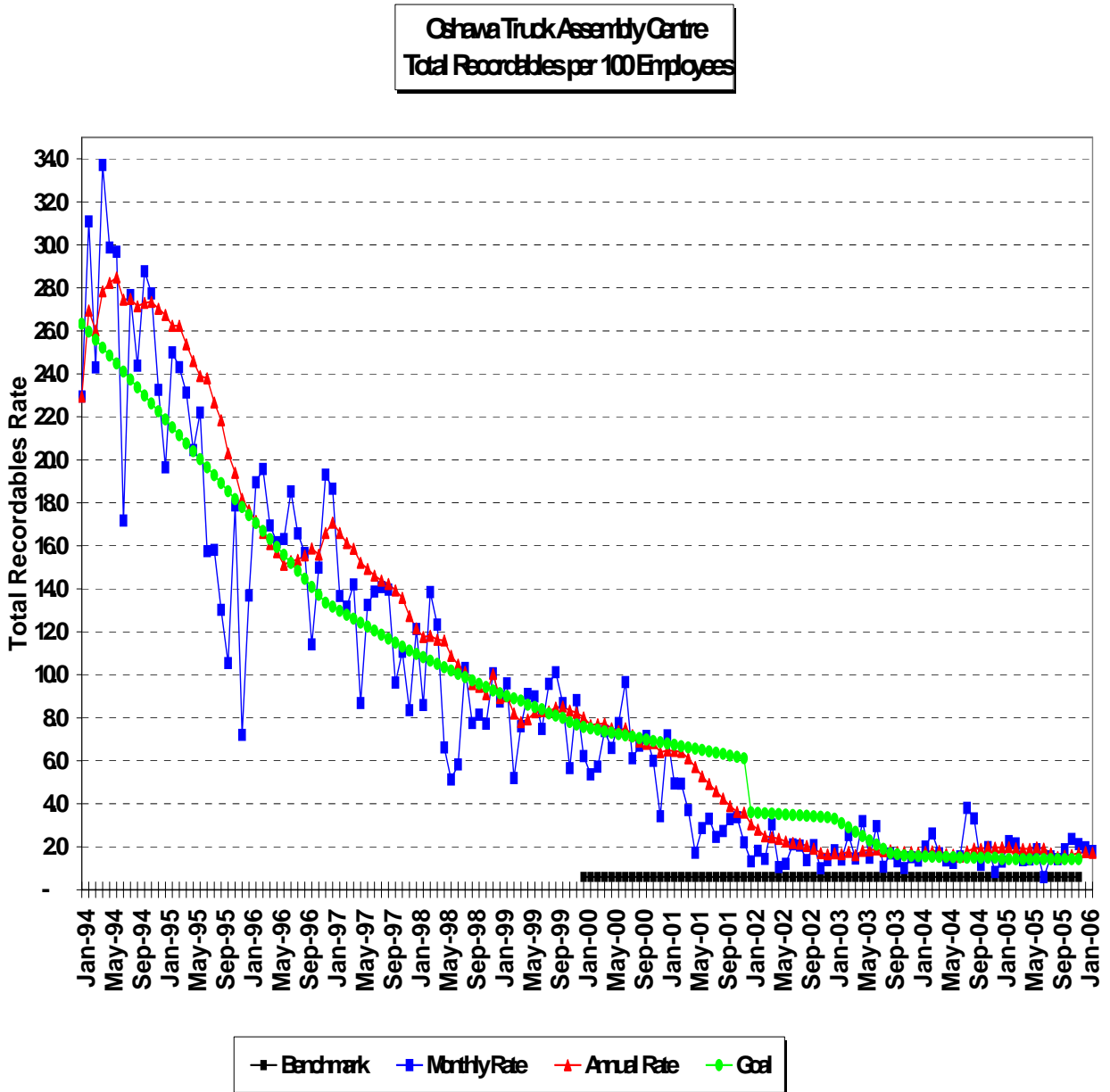


Fig. 8. Total recordables rate per 100 employees at the Oshawa Truck Assembly Centre for 1994-2006.

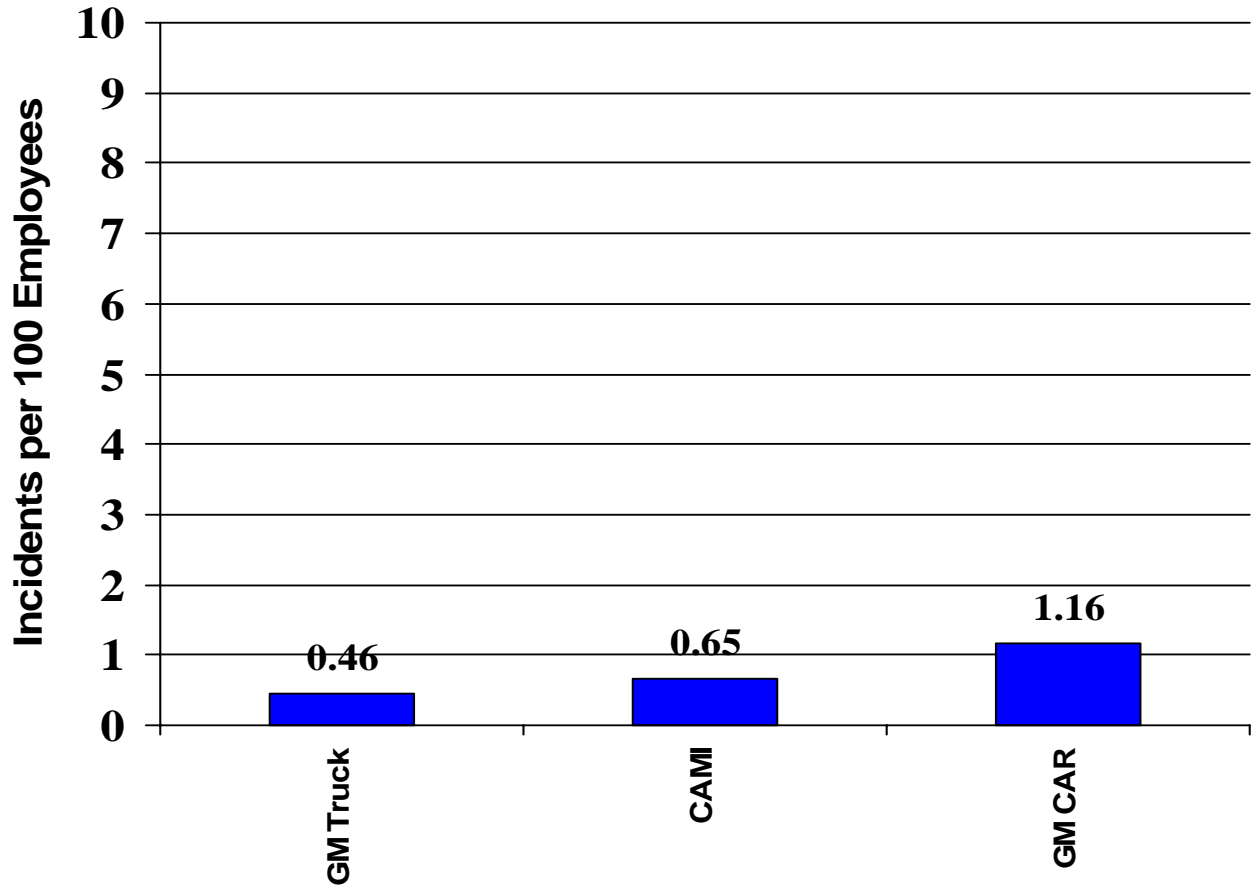


Fig. 9. Comparison of incident rate (per 200,000 hours worked) for different GM auto assembly plants in Ontario for 2002.

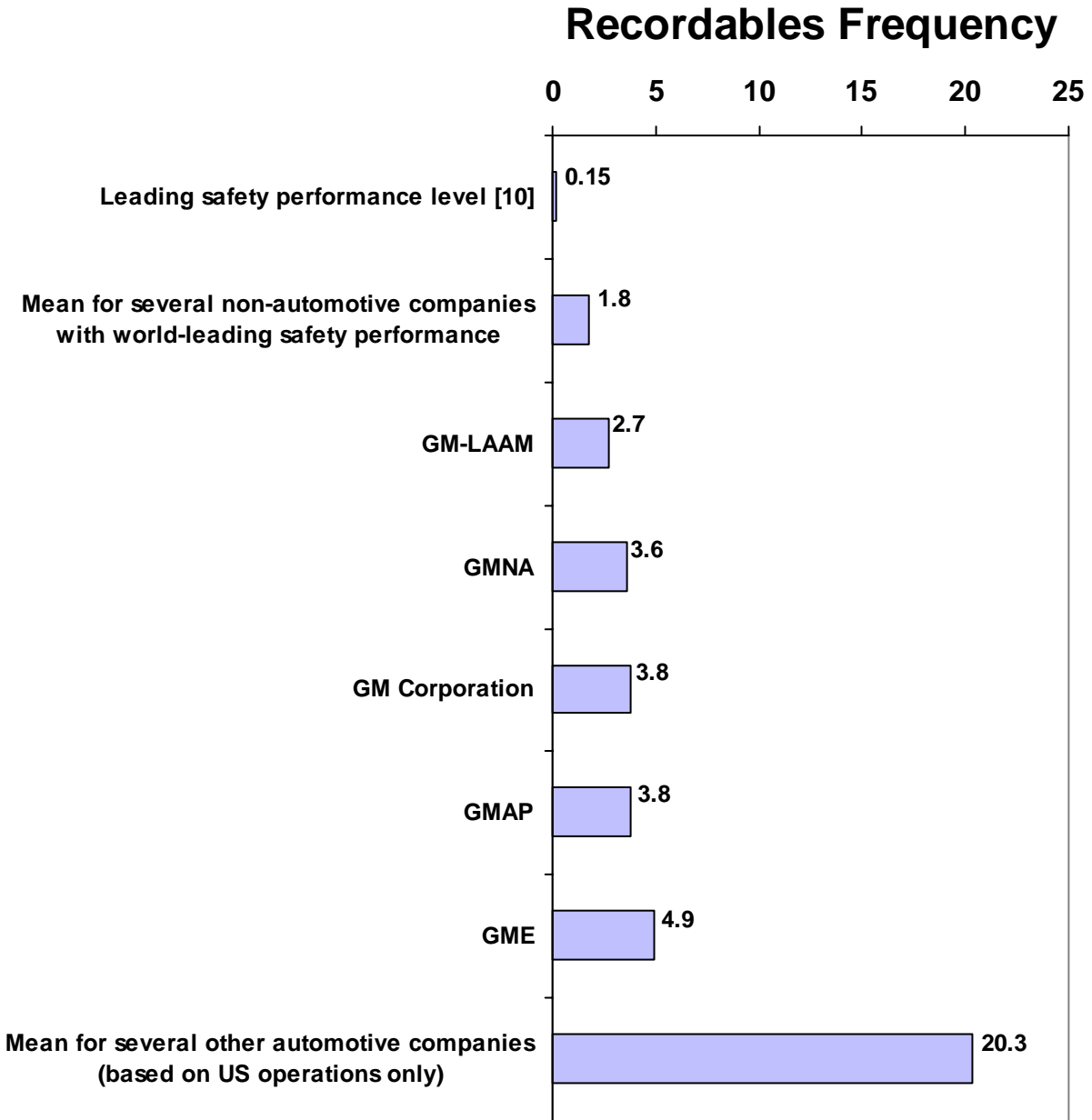


Fig. 10. Comparison of recordables frequency (per 200,000 hours worked) for different companies for 2002. General Motors corporation is shown along with its main geographic units: GM Latin America, Africa and the Middle East (GM-LAAM), GM North America (GMNA), GM Asia and Pacific (GMAP), and GM Europe (GME).

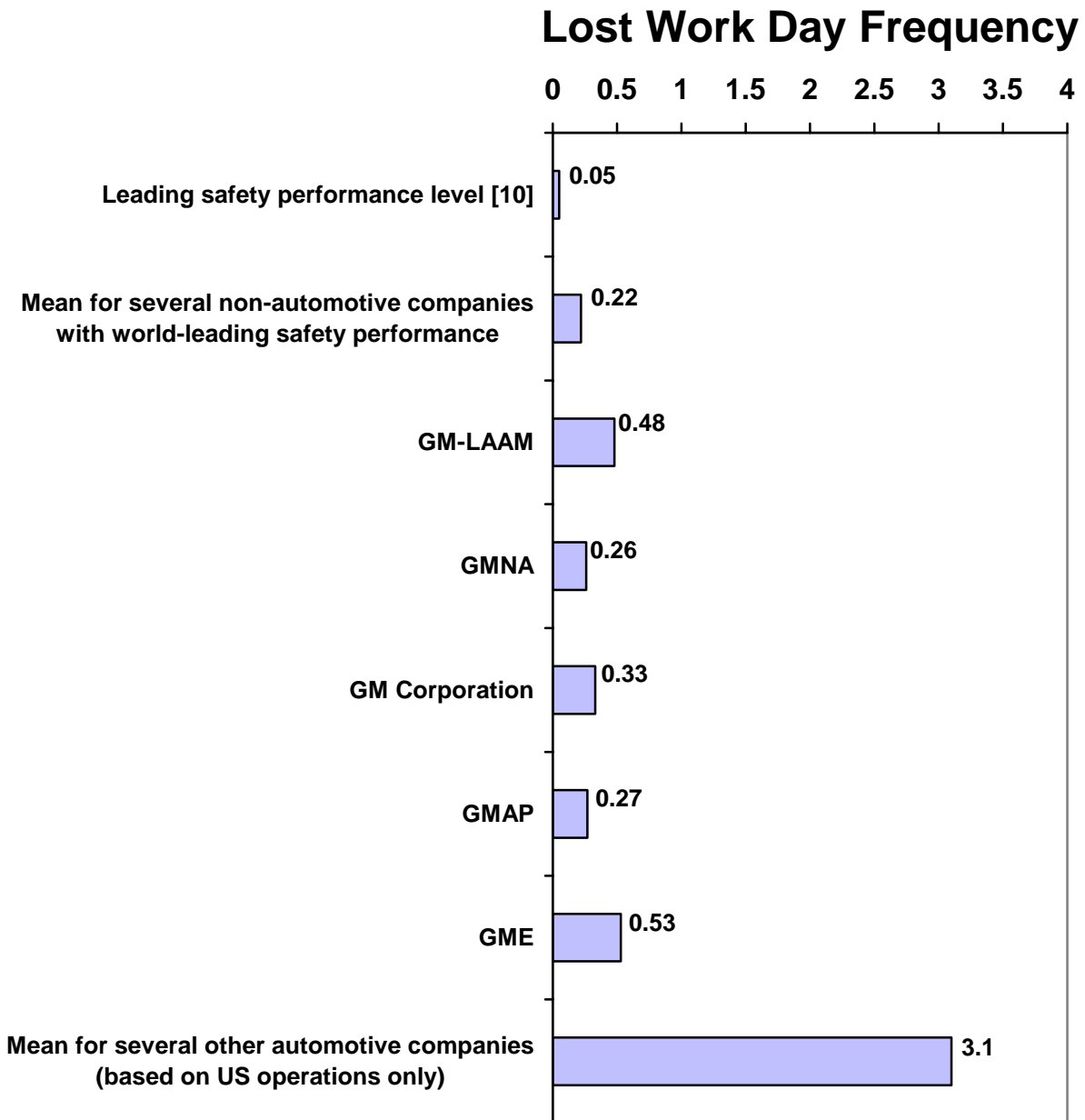


Fig. 11. Comparison of lost work day frequency (per 200,000 hours worked) for different companies for 2002. General Motors corporation is shown along with its main geographic units: GM Latin America, Africa and the Middle East (GM-LAAM), GM North America (GMNA), GM Asia and Pacific (GMAP), and GM Europe (GME).