

Mandatory Reporting of Hazardous Exposures by Firefighters

A Report to the Legislature

January 2016

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Executive Summary

Introduction

In the course of routine work, firefighters¹ are exposed to health hazards as a result of emissions from fires, chemicals from spills and accidental releases, potentially infectious materials from individuals, and other known disease-causing substances. Currently, no system exists for firefighters to document and report these work-related hazardous exposures.

In March 2015, the Washington State Legislature passed Substitute House Bill 1604 (SHB 1604), which requires the Department of Labor & Industries (L&I) to form a work group to discuss establishing definitions, policies and procedures for mandatory reporting of hazardous exposures suffered by firefighters in the course of employment. The work group, including representatives of firefighter unions, fire departments, fire chiefs, state fund public employers and self-insured employers, began meeting in August 2015. The legislation requires a report from the work group, with any recommendations for legislation or rulemaking, to be submitted by January 1, 2016.

This report provides the results of work group meetings. It includes:

- A definition of “reportable hazardous exposure.”
- A review of existing fire incident and hazardous reporting systems.
- A review of potential changes to existing safety standards in the Washington Administrative Code (WAC) for mandatory or voluntary reporting of hazardous exposures suffered by firefighters.

No recommendations for law changes were agreed to.

Information requested by the Legislature

Reportable hazardous exposure definition

Work group members generally agreed that a definition of “reportable hazardous exposure” was necessary for an exposure to qualify as hazardous, and therefore be reportable. A proposed definition is included in this report.

Existing reporting systems

The stakeholder work group extensively evaluated two reporting systems in terms of their ability to meet the requirements of SHB 1604. The systems are the National Fire Incident Reporting System (NFIRS), and the recently developed Personal Injury, Illness, and Exposure Reporting System (PIIERS). In Washington, NFIRS is known as the Washington Fire Incident Reporting System

¹ Fire agency personnel including all employees and volunteers of fire protection jurisdictions and fire authorities.

(WAFIRS). WAFIRS was designed to enable reporting on incidents, while PIIERS was designed to enable firefighters to report exposures, injuries and illnesses.

The work group reached consensus that WAFIRS should be adequately funded, whether or not it is used for personal exposure reporting.

There was no consensus that PIIERS or WAFIRS should be the mandated exposure reporting system.

Potential changes to safety standards

The work group found that the L&I Safety Standards for Firefighters contained in the current rule (WAC 296-305) could be modified to:

- Establish a definition for “reportable hazardous exposure.”
- Mandate the reporting of “reportable hazardous exposures.”
- Include criteria for reporting processes.
- Establish contents of an exposure report consistent with the content of PIIERS.
- Establish record retention policies and other policies and procedures useful to accomplish SHB 1604.

While these changes were considered, the work group did not reach consensus to modify L&I’s Safety Standards for Firefighting or to make firefighter hazardous exposure reporting mandatory, although there was consensus that exposure reporting is beneficial.

Introduction

In the course of routine work, firefighters² are exposed to health hazards as a result of emissions from fires, chemicals from spills and accidental releases, potentially infectious materials from individuals and other known disease-causing substances. Currently, no system exists for firefighters to document and report these work-related hazardous exposures. Substitute House Bill 1604 (SHB 1604), passed by the Legislature in March 2016, requires the Department of Labor & Industries (L&I) to form a work group to study and report recommendations about firefighters' work-related hazardous exposures. This report provides information about work group meetings, actions taken and recommendations.

² Fire agency personnel including all employees and volunteers of fire protection jurisdictions and fire authorities.

Information Requested by the Legislature

Stakeholder work group members include representatives from:

- The Washington State Council of Firefighters (WSCFF).
- The Firefighter Cancer Support Network (FCSN).
- The Washington Fire Chiefs (WFC).
- The Washington State Fire Marshal’s Office (WSFM).
- State fund public employers.
- Self-insured employers.
- L&I (an occupational medicine/internal medicine physician; industrial hygienists; a veteran workplace policy and standards expert; and a lawyer serving as a policy expert).

The work group met eight times beginning in August 2015. The group specifically discussed the potential definitions, policies and procedures necessary to support possible future regulation or legislation mandating reporting of firefighters’ hazardous exposures.

This report provides the results of the work group discussions, including:

- A possible definition of “reportable hazardous exposure.”
- A review of current fire incident and hazardous reporting systems for capturing firefighter exposures to hazardous work environments.
- A review of possible rule modifications related to mandatory or voluntary reporting of hazardous exposures suffered by firefighters.

REPORTABLE HAZARDOUS EXPOSURE DEFINITION

Development of a definition

An exposure must qualify as “hazardous” in order to be reportable. The stakeholder work group members generally agreed that a definition of “reportable hazardous exposure” is necessary in order to determine whether an exposure is reportable. Since the fundamental definition of hazardous exposure used by federal and state agencies cannot be directly applied to determine which hazardous exposures experienced by firefighters should be entered into a reporting system, it is not practical or sufficient to adopt a standard universal definition of this term and apply it to the context of firefighting.

The work group extensively discussed the terms “hazardous exposure,” “reportable hazardous exposure” and “mandatory” in an attempt to develop definitions and supporting policies that are both applicable to the work done by firefighters and fire agency staff and agreeable to all stakeholders.

Work group members generally agreed that the definition of hazardous exposure should contain established definitions and a set of criteria specifically defining what constitutes a hazardous exposure for firefighters, thus enabling a representative company officer or other competent person within a department to determine whether a hazardous exposure has occurred.

A definition of “reportable hazardous exposure” could be established through L&I’s rulemaking process. Once the term is properly defined and established through rulemaking, existing rules could be modified to mandate the reporting of qualifying exposures.

The work group agreed to attempt to define “reportable hazardous exposure” using existing definitions and criteria. As the term “exposure” is not currently defined in the Safety Standards for Firefighters, the group developed the following definitions:

- “An exposure is the contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition, whether or not protection is provided by personal protective equipment (PPE). Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.”
- “An exposure is a contact an employee has with a hazardous material or substance, harmful physical agent or blood borne pathogen or other potential infectious material, or oxygen deficient condition, whether or not protection is provided by personal protective equipment. Occupational exposure means reasonably anticipated skin, eye, mucous membrane or parenteral contact with blood or other potentially infectious material.”

Either definition could be included in the Safety Standards for Firefighting (WAC 296-305) through rulemaking. Several additional definitions currently in the Safety Standards for Firefighting could modify the definition of a reportable hazardous exposure and could be considered in the rulemaking process. These definitions as stated in WAC 296-305 include:

- **Hazardous area:** The immediate area where members might be exposed to a hazard.
- **Hazardous atmosphere:** An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (escape unaided from a permit-required confined space), injury or acute illness caused by one or more of the following:
 - Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL).
 - Airborne combustible dust at a concentration that meets or exceeds its LFL.
 - Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.

- Atmospheric concentration of any substance which may exceed a permissible exposure limit.³
- **Hazardous material:** A substance (solid, liquid or gas) that when released is capable of creating harm to people, the environment and property.
- **Hazardous substances:** Substances that present an unusual risk to persons due to properties of toxicity, chemical activity, corrosivity, etiological hazards or similar properties.
- **Hazard control zones:**
 - Exclusion zone: The control zone designated to exclude all unauthorized personnel, responders and equipment.
 - Hot zone: The control zone immediately surrounding the hazard area, which extends far enough to prevent adverse effects to personnel outside the zone. The hot zone presents the greatest risk to members and will often be classified as an “immediately dangerous to life and health” (IDLH) atmosphere.
 - Warm zone: The control zone outside the hot zone where personnel and equipment decontamination and hot zone support takes place.
- **IDLH:** Immediately dangerous to life and health.

In addition to existing definitions, the work group agreed that several possible reporting criteria are reasonable, including:

- Determination of hazardous exposure by a representative company officer or other designated competent person trained and experienced in the definition and assessment of hazardous exposures.
- Ability of individual firefighters to report a hazardous exposure.
- Use of a set of existing qualitative metrics, including:
 - Visible emissions (e.g., fumes, dusts, aerosols).
 - Suspected or known presence of a chemical, biological, radiological or nuclear hazard (e.g., carbon monoxide, odor, body fluid exposure).
 - Responder symptoms associated with an incident (e.g., respiratory or skin conditions).
- Use of hazard control zones, hazardous substances and hazardous materials in the reporting criteria definition.

³ For additional information about atmospheric concentration, see WAC 296-62, Parts F, G, and I, General occupational health standards and WAC 296-841, Airborne contaminants.

REPORTING SYSTEMS

The work group extensively evaluated two reporting systems in terms of their ability to meet the goals of SHB 1604: the National Fire Incident Reporting System (NFIRS) and the recently developed Personal Injury, Illness, and Exposure Reporting System (PIIERS). In Washington, NFIRS is known as the Washington Fire Incident Reporting System (WAFIRS).

Washington Fire Incident Reporting System (WAFIRS)

WAFIRS is an all-incident reporting system⁴ that enables every fire department to electronically document incidents in a uniform format. In Washington, fire departments are required by law to report fire incidents; however, most reporting agencies report all incidents.⁵ WAFIRS currently has the capacity to document involvement of individual firefighters for each incident.

Until 2011, WAFIRS was housed in the Washington State Fire Marshal's Office within the Washington State Patrol. It was then transferred to the Washington Fire Chiefs (WFC). Since public funding was discontinued in 2011, the WFC has sustained the program with essentially no dedicated funding. Without dedicated funding, the program has deteriorated. In 2010, 85 percent of fire departments reported to WAFIRS; currently, 52 percent report. It is worthwhile to note (and appreciate) that the Washington Fire Chiefs sustained the WAFIRS program with essentially no dedicated funding.

There was consensus among the work group that WAFIRS is vital to fire prevention efforts in Washington and should receive dedicated funding to fulfill its mission; however, the group determined that WAFIRS does not specifically meet the needs of a mandatory hazardous exposure

⁴ NFIRS/WAFIRS has nine groups of incident codes, including: Fire; Overpressure Rupture, Explosion, Overheat; Rescue and Emergency Medical Service (EMS) Incidents; Hazardous Condition (No Fire); Service Call; Good Intent Call; False Alarm and False Call; Severe Weather and Natural Disaster; and Special Incident Type. The nine groups are further broken down into 178 specific incident types.

⁵ RCW 43.44.060, Statistical information and reports.

(1) The chief of each organized fire department, or the sheriff or other designated county official having jurisdiction over areas not within the jurisdiction of any fire department, shall report statistical information and data to the chief of the Washington state patrol, through the director of fire protection, on each fire occurring within the official's jurisdiction and, within two business days, report any death resulting from fire. Reports shall be consistent with the national fire incident reporting system developed by the United States fire administration and rules established by the chief of the Washington state patrol, through the director of fire protection. The chief of the Washington state patrol, through the director of fire protection, and the department of natural resources shall jointly determine the statistical information to be reported on fires on land under the jurisdiction of the department of natural resources.

(2) The chief of the Washington state patrol, through the director of fire protection, shall analyze the information and data reported, compile a report, and distribute a copy annually by July 1st to each chief fire official in the state. Upon request, the chief of the Washington state patrol, through the director of fire protection, shall also furnish a copy of the report to any other interested person at cost.

reporting system. The group defers to the legislative process the question of whether WAFIRS is maintained with the Washington Fire Chiefs or returned to the Washington Fire Marshal's office.

Personal Injury and Illness Exposure Reporting System (PIERS)

The Washington State Council of Fire Fighters (WSCFF) developed and financially supports the PIERS system to enable collection of personal exposure information. PIERS is modelled after a similar system in California which has been used for more than a decade to document personal exposures. It is an online reporting system that individual career firefighters can use to privately report injuries, illnesses and hazardous exposures. The WSCFF stores and manages the data.

The aims of the PIERS system are to:

- Accumulate data on workplace hazardous exposures that individual firefighters may use to support a causal association between workplace exposures and cancer.
- Serve as a means for prevention of hazardous exposure. This may be achieved through:
 - Increased recognition by the individual firefighter of circumstances leading to hazardous exposures.
 - Data analyses identifying common patterns of exposure.
 - Data collection for possible future research questions linking firefighter exposure to diseases.

Over the course of the work group meetings, the WSCFF demonstrated PIERS on two occasions. The work group discussed its strengths and weaknesses at length.

Reporting system comparison

WAFIRS and PIERS are characterized in this report to differentiate their strengths and weaknesses and the specific objectives and utility of each system (see Appendices B and C). From the perspective of the work group, the two systems are complementary, with each providing data not captured by the other.

Firefighters from the WSCFF are strongly in favor of mandating or at least achieving a high rate of hazardous exposure reporting, and believe that PIERS is the best system for entering and storing reports.

Members from the Association of Washington Cities (AWC) and others are concerned that PIERS could be time-consuming given the potentially high number of users; that there are no well-defined long-term plans to use data from PIERS for departmental or other hazardous exposure prevention efforts; and that, as a privately held system, there would be no guarantees for access or ongoing quality control.

The WFC shares the AWC's concerns. More discussion is needed on details of employer responsibilities with regard to funding and control of the PIERS system.

The WFC supports WAFIRS because it covers career and volunteer firefighters, is an established system, and would have low training and implementation costs. Once the funding, control and responsibilities of WAFIRS are determined, the WFC supports consideration of the PIERS system to augment the data collected for career members through WAFIRS.

REPORTING HAZARDOUS EXPOSURES

Mandatory reporting

Relevant existing rules

L&I's rules set Safety Standards for Firefighters to "assist employees and employers in achieving the safest workplace obtainable under the condition to which employees are or will be exposed." The L&I rules include standardized safety and health definitions for consistent interpretation across the state, mandate injury and illness reporting, and outline employer and employee responsibilities for safety.

Injury and illness reporting under these rules is done by a standardized process requiring employers to maintain injury and illness records and annually post the data in their workplace.

Two components of the existing rule relate to reporting of hazardous exposures by firefighters:

- WAC 296-305-01503 states that for "... incidents resulting in exposure to occupational disease-causing chemicals or physical agents, a preliminary investigation of the cause shall be conducted. The investigation shall be conducted by a person designated as qualified by the employer."
- WAC 296-305-01507(2)(c) requires the fire department's health and safety officer to "ensure that records are kept" for "(i) accidents; (ii) injuries; (iii) inspections; (iv) exposures; ..."

Other sections of the rules require employers to maintain a safe and healthful work environment as it applies to both nonemergency and emergency conditions,⁶ and provide, maintain and clean appropriate personal protective equipment.⁷ These sections of the rule reflect an employer's responsibility to protect a firefighter from exposures occurring during the course of work.

Rulemaking for mandatory reporting

Once the term "reportable hazardous exposures" is properly defined by rulemaking, existing rules could be modified to mandate reporting. The rulemaking process could also establish criteria for reporting processes, contents of an exposure report, record retention policies, and other policies and procedures to accomplish uniform mandatory reporting.

⁶ WAC 296-305-01509

⁷ WAC 296-305-02001

Any changes made to existing rules would need to be within L&I's statutory authority and must meet requirements of the Administrative Procedures Act, including the "least burdensome" provisions.

Relative to SHB 1604, changing the existing safety standards would:

- Allow systematic mandatory implementation of reporting across all fire departments.
- Include a deliberative rulemaking process, which allows further consideration of system development and system requirements.
- Provide clarification to existing rule language that requires exposure documentation.
- Mandate employers to require reporting by firefighters (assumes greater compliance with reporting) with L&I oversight and possible compliance assessments.
- Provide a reportable hazardous exposure definition in rule, as well as written criteria for reporting triggers.

Issues with mandatory reporting

There was consensus within the work group that documenting hazardous exposures could be beneficial to the health and safety of firefighters. There was no consensus about mandating reporting of hazardous exposures to firefighters. Neither was there consensus about using PIIERS or WAFIRS to implement mandatory reporting.

According to L&I's standards and policy expert, if mandatory reporting of hazardous exposures were required by rule, it would not be common practice to mandate that a specific software or data collection system such as PIIERS, WAFIRS or private vendor software be used. However, multiple data collection software programs could impair the use of data for prevention purposes. PIIERS is currently fiscally sustainable for use by union firefighters, but it is funded for only members of the WSCFF. Should reporting become mandatory, which would greatly increase the number of users and reports, funding would need to be found for non-union users. Modifying WAFIRS, for example, would require an investment in creating a personal hazardous exposure reporting module for firefighters.

Some work group members had concerns about modifying the existing safety standards, including:

- Benefits of exposure reporting and ways to use the data are not readily apparent to many employers. The value of the reports may not offset the volume and expense of the documentation.
- Requiring reporting by rule would place the burden of administration on the employer. This includes retaining records for at least 30 years, possibly producing exposure reports for public disclosure and, for WAFIRS, maintaining compatible software for decades.
- Since existing fundamental broad definitions (e.g., all instances of an emergency response) would be used, the breadth of the hazardous exposure reporting definition could result in an overwhelming amount of data and time spent entering reports. A definition limiting the

hazardous exposure reporting definition to those exposures in the warm and hot zone would alleviate some burden of reporting.

- Modifying existing rules could have unintended and/or unanticipated negative effects.

Voluntary reporting

In the absence of rules mandating reporting, firefighters may voluntarily initiate an exposure report in PIIERS. Voluntary entry of reportable hazardous exposures into PIIERS could be encouraged in a way similar to participation in existing workplace health and wellness programs. Voluntary reporting via PIIERS could be promoted as a priority culture change and implemented with the same definitions, criteria, and recommended policies and procedures as for mandatory reporting. However, voluntary programs often result in incomplete capture of records.

Conclusion

The work group authorized under SHB 1604 discussed the possibility of mandating reporting of personal hazardous exposures by firefighters. Results of these discussions are:

- The work group did not reach consensus on mandating reporting of personal hazardous exposures by individual firefighters.
- The work group agreed on general components of a definition of “reportable hazardous exposure” as applied to firefighters. The rulemaking process could establish this definition, but the work group did not agree to proceed with rulemaking.
- The work group agreed that a possible hybrid system composed of elements of WAFIRS and PIIERS could serve as a means to record personal hazardous exposures.
- The work group agreed that WAFIRS should be funded to attain the highest reporting and data use levels possible, even though it may not be feasible for use in exposure reporting since WAFIRS relies on second-hand reporting (e.g., the company officer completes the reports, not the affected employees).
- Most work group members agreed that firefighters experience frequent and highly hazardous exposures compared to other occupations, and that these exposures are worth recording. However, some work group members expressed concerns about the utility of the data collected by PIIERS other than serving as logs of personal exposures, and the administrative burden on employers of such voluminous data collection.

Recommendations

1. Fund the Washington Fire Incident Reporting System (WAFIRS) to fulfill its mission for fire prevention in Washington. Improvements to and funding of WAFIRS will allow documentation of firefighters' participation in incidents tracked by WAFIRS. The work group recommends the following improvements to WAFIRS:
 - Allocate funding for at least three full-time WAFIRS staff positions:
 - A program manager who serves as the primary data analyst, keeps oversight of the system, assesses the future development of the system and coordinates at the local, state and federal level for program operations.
 - A technical and database manager to serve small and large departments' technical needs and facilitate individualized data queries.
 - A statewide training and outreach coordinator to help improve use of the system and train those who need assistance with data entry. While WAFIRS was previously supported by state funds, that funding no longer exists.
2. Determine the future location of WAFIRS – either maintained with the Washington Fire Chiefs or moved to the Washington State Fire Marshal's office.

If program funding occurs, the WAFIRS program should:

3. Adopt a program enhancement, management and sharing plan that includes specific strategies and activities as described in Figure 1. Adopting and consistently implementing and improving the strategies and activities listed in Figure 1 should lead directly to the short-term outcomes listed. Once these have been achieved, program managers can begin to use data to work toward mid- and long-term outcomes.
4. Investigate and identify system software that best meets the needs of the fire service, is more efficient and less time intensive than current software, and can be used by all fire protection jurisdictions and fire authorities in Washington.
5. Form an oversight committee composed of volunteers knowledgeable about the interests of the firefighting community to evaluate and recommend improvements to the program.
6. Further consider the increased use of WAFIRS and elements of the Personal Injury, Illness, and Exposure Reporting System (PIIERS) to document hazardous exposures. Fifty-two percent of fire departments already use WAFIRS to uniformly report on the full range of their activities, from fire incidents and emergency medical services to equipment involved in the response. WAFIRS currently has the capacity to be used more consistently to report details of personal hazardous exposures. This capacity could be enhanced by adding components of hazardous

exposure reports from PIERS that could be entered by firefighters into WAFIRS. These system improvements would require:

- Adopting a uniform definition of and criteria for determining a “reportable hazardous exposure.”
- Identifying characteristics of common hazardous exposures, such as training incidents, fire station exposures or known determinants of disease that are missing from the current version of the incident reporting systems; and reviewing the feasibility of adding them to the system.
- Developing model written policies and procedures on data security and confidentiality; reviewing them at least annually and revising them as needed; and ensuring their review by and accessibility to all staff members with authorized access to confidential individual-level data.
- Requiring exposure reports to be submitted within one week following exposure, which would limit recall bias. Exceptions could be allowed, but only in limited cases such as extended leave, injury or illness that prevented reporting.
- Providing consistent administrative oversight and review within the departments to ensure more complete data.
- Developing training programs with requirements for initial and follow-up training on definitions, policies, data security and confidentiality policies and procedures.
- Documenting training of all firefighters and other system users.
- Clearly defining and specifying the purpose for each data element to be collected.
- Establishing measures and goals for system user enrollment and reporting.
- Establishing measures and goals for data quality.
- Establishing review criteria for data and reports.

Figure 1: Enhancing hazardous exposure reporting activities and outcomes

Strategies and Activities	Short-term Outcomes	Mid-Term Outcomes	Long-Term Outcomes
<p>Improve representativeness and quality of data:</p> <ol style="list-style-type: none"> 1. Identify, recruit, and onboard departments and database and data quality managers 2. Establish data use and data sharing agreements with cloud environment owner and external entities 			
<p>Improve data quality, timeliness and utility (i.e., data are complete, valid, reliable and useful):</p> <ol style="list-style-type: none"> 1. Register users for the system 2. Conduct data quality assessments 3. Use exposure and incident data and analytic tools for exposure control decision-making 4. Collaborate among user departments for health events of regional or national interest 	<p>Improved geographic and population-based representativeness of incidence and exposure data</p> <p>Improved incident and exposure data quality (i.e., data are complete, valid, and reliable)</p>	<p>Increased data sharing between/among jurisdictions for local/regional/national health events</p>	<p>Improved synergy/integration of exposure data with other systems within participating departments</p>
<p>Strengthen exposure reporting practices:</p> <ol style="list-style-type: none"> 1. Maintain or establish interdepartmental working groups 2. Participate in interstate and national activities and other professional development activities that further exposure reporting and practice 3. Encourage annual meetings with departments using similar systems 	<p>Improved knowledge and ability of department staff in systematic data capture, data quality assurance and management</p> <p>Enhanced use of reporting and data use within state and local jurisdictions</p>	<p>Timely identification of exposures for anticipated or present health threats</p>	<p>High quality exposure data for improved nationwide all-exposure situational awareness used for exposure and disease prevention decision-making, enhanced responses to hazardous exposure events and illness.</p>

Appendices

Appendix A

Attendees of Substitute House Bill 1604 (SHB 1604) work group meetings

Attendee	Organization
Bill Barber	Battalion Chief West Pierce Fire and Rescue/ Washington Fire Chiefs
Brian Bishop	Association of Washington Cities
Candice Bock	Association of Washington Cities
David Bonauto	L&I
Pete Bourgeault	City of Bellevue/Washington Self-Insurers Association
Brian Chin	Washington Department of Labor and Industries/ University of Washington
Chuck Duffy	State Fire Marshal
Sheila Gall	Association of Washington Cities
Kathleen Harmon	Washington Fire Chiefs
Bill Hoover	Firefighter Cancer Support Network
Renaee Knowles	Washington Department of Labor and Industries
Helen Kramer	Washington State Council of Fire Fighters
Maggie Leland	Washington Department of Labor and Industries
Alan Lundeen	Washington Department of Labor and Industries
Greg Markley	Washington State Council of Fire Fighters
Chad Michael	Deputy Chief Renton Fire & Emergency Services
Eric Monroe	Firefighter Cancer Support Network
Steve Perry	King County Medic One
Mark Peterson	Fire Chief Renton Fire & Emergency Services/ Washington Fire Chiefs
Matt Riesenber	King County Medic One
Keven Rojecki	Washington State Council of Fire Fighters
Todd Schoonover	Washington Department of Labor and Industries
Geoff Simpson	Washington State Council of Fire Fighters
Michael White	Washington State Council of Fire Fighters

Appendix B

Figure 2: Characteristics of Personal Injury, Illness, and Exposure Reporting System (PIIERS) and Washington Fire Incident Reporting System (WAFIRS) reporting systems

Evaluation Criteria	PIIERS	WA FIRS
1. System Structure		
Start Date	2015	1970's
System owner	WSCFF	National – FEMA US Fire Protection Agency State – Currently, Washington Fire Chiefs Local – Fire department or jurisdiction
Data entry	Firefighter	Company Officer or Incident Commander
Data access	Firefighter; not employer	Employer, State, National Systems, not firefighter
Who updates system	Specific data fields created by system owners	Control at national level; state can develop specific modules
Software systems	One	System requirements developed by data owners; multiple software packages
Staffing support	WSCFF	Currently volunteer through WA Fire Chiefs
Adequate funding	For usage levels up to IAFF District 7 union members	No; percentage reporting by departments has been decreasing.
Training available	In process to be more widely available; necessary to train all 8000 FF in WA	Available; required to train multiple individuals in each department
Statutorily mandated	No	Yes (RCW 43.44.060) (incidents, not individual hazardous)
Population of firefighters currently covered	Union members; plan to expand with fee for service to non-union members	All volunteers and employees of a fire protection jurisdiction and fire authorities
Possible variation in criteria triggering report	Incidents may be interpreted differently and data entry likely less uniform; should be rectified if consistent definitions adopted in rule	All incidents recorded; may include those incidents without exposure; should be rectified if consistent definitions adopted in rule

2. Data Structure		
Definitions available for data entered	No	Yes, detailed data definitions and entry codes; supported by reference guide for each data element entered
Is data entry efficient and user friendly	Yes	Modular system based on incident type; software available may or may not be efficient, user friendly or updated regularly; data entry by one person for all firefighters at each incident
Data completeness	No required entry fields or defined data entry patterns for exposure; unable to determine if entry is complete or incomplete, easily modified to require certain fields be completed	Required entry fields or defined data entry patterns for exposure; unable to determine if entry is complete or incomplete
Data specific to personal exposure	Yes; data are entered by firefighter reflecting firefighter exposure at incident.	No; data entered by one person for all firefighters at each incident
3. Uses		
Firefighter exposure reports	Yes, only for current participants who enter data; provides summary of exposure data	Yes, but currently limited to fire departments utilizing specific firefighter exposure modules and would report only incidents (e.g. vehicle fires) in which the firefighter participated
Fire Prevention Activities	No	Yes
Evaluate Resource Utilization	No	Yes
Document Specific Exposure Incidents	Includes training and 'non-NFIRS incident exposures'	Doesn't include training and non-incident exposures
Research for cancer causation	Unlikely; requires lengthy time period to accrue a large number of exposure reports and the occurrence of a sufficient number of cancer outcomes	Unlikely; requires lengthy time period to accrue a large number of exposure reports and the occurrence of a sufficient number of cancer outcomes
Assists in the evaluation of causal association between cancer and work in WC	Possibly, if kept throughout course of career and coupled to additional scientific research on cancer causation	Possibly, if kept throughout course of career and coupled to additional scientific research on cancer causation

Appendix C: Strengths and weaknesses of existing reporting systems

Washington Fire Incident Reporting System (WAFIRS) strengths

- **Demonstrated past success:** The primary strength of the WAFIRS system is that it is well established and has had high rates of reporting among affected agencies for several years. All members of the work group agree that WAFIRS should be maintained at the highest reporting and data use levels possible.
- **Sufficient data structure to track incidents (not personal exposures):**
 - WAFIRS currently allows for entering and tracking of systematically coded detail of fire and hazardous materials exposures at the individual level, and has the potential to expand the amount of personal exposure information that can be entered. Research staff from L&I feel that consistent collection and entry of individual firefighter incident response information, including fire type, hazardous materials type and cumulative exposure time, can be linked to toxicological properties of known constituents of specific fire types and hazardous chemical reports. These data can be used to estimate the strength of association between exposures and certain health outcomes. Members of WSCFF and some firefighters feel that the information collected by WAFIRS is not currently, and will not be able in the future, to adequately represent the frequency, characteristics or severity of hazardous exposures encountered. This was the rationale for PIERS development.
 - WAFIRS uses systematic coding systems for incident types and characteristics, hazardous materials and apparatus used, which are shared by all agencies and states. These systems are well-defined and have supporting educational materials.
 - ❖ Coding lists are alphabetized, which simplifies code look-ups.
 - ❖ System allows for the inclusion of optional state or local data storage and retrieval.
 - ❖ System recognizes that there may be a future need for additional data elements to meet local situations. Modules can be built and added to the system at the state and federal level.
 - ❖ System has the capacity to enter one-time information for the purpose of special studies that could be used to report novel or unique exposures.
- **Available experienced program staff:** Personnel who maintained WAFIRS under the State Fire Marshall's Office are still on staff and would be available to run the program if it were transitioned back to the State Fire Marshal's office. Similarly, the Washington Fire Chiefs has personnel familiar with the system and, if funded sufficiently, could improve fire department reporting.
- **Strong federal government support for system:** WAFIRS' connection to the NFIRS program provides centralized management and extensive technical assistance to state programs and department personnel responsible for reporting. The most recent upgrade to NFIRS provides free software to departments to enable data entry and uploading to NFIRS.

Also available is the “NFIRS 5.0 Complete Reference Guide (January 2015),” which provides step-by-step instructions for submitting fire incident information to NFIRS. WAFIRS uses an established incident coding and terminology system shared by all reporting agencies, known as NFPA 90, Standard Classifications for Incident Reporting and Fire Protection. The system is established and supported by the U.S. Department of Homeland Security’s FEMA and the U.S. Fire Protection Agency.

- **Demonstrated success using state and national data:** At the state level, WAFIRS data has been used to help pass important bills on fireworks and arson. At the local level, the data collected are particularly useful for designing fire prevention and education programs. WAFIRS gives vital information on response times, allowing comparisons across geographic jurisdictions. Nationally, NFIRS has been used by various private industry organizations, including national associations for home appliance product manufacturers, the hotel and motel industry, insurance companies, attorneys and many others.
- **Focused training to representatives from each fire department:** The occurrences of reportable hazardous exposures would be determined by one representative company officer or other designated competent person, using a uniform definition and set of criteria. The definition would encompass established definitions like whether an individual were in a hot or warm zone or exposed to hazardous materials. The criteria would include qualitative aspects of exposures and the discretion of the representative. The same representative company officer or other designated competent person would then be responsible for reporting individual exposures into the WAFIRS reporting system. Training representatives from the each fire department, rather than every firefighter, would significantly reduce the number of those requiring training.
- **Less administrative burden for public disclosure requests:** WAFIRS has strengths related to public records because it does not collect private health information (PHI) and collects less information directly related to individual firefighters’ work activities and exposures. This information could be sensitive if disclosed as public records. However, the limited data collection may be a weakness in that the data collected may not fully describe the exposure.

WAFIRS weaknesses

- **Does not capture personal hazardous exposure information as requested by SHB 1604:** The primary weakness of the WAFIRS incident reporting system is that it does not capture detailed personal hazardous exposure information. Individual firefighters would not be able to determine what constitutes hazardous exposures or enter them into WAFIRS. Examples of details of hazardous exposures not captured by WAFIRS include: the time an individual spent in the hot zone of a particular type of fire; the opacity of the smoke inhaled; the color of the aerosol settled onto the skin; or a novel or atypical hazardous exposure experienced in the course of work.
- **Limited data access:** In addition to lack of personal exposure details, WAFIRS is not designed for data to be accessed by individuals or all departments. Some fire departments may submit reports to NFIRS or a centralized records management system (RMS), but do not have the resources to store, manage or retrieve the data at the local level. It may be difficult

for these departments to retrieve local or individual-level data or reports in a timely manner. The current state system does not provide this data either. WAFIRS is not designed or intended to keep individual personnel records or be used by individuals in the case of personal injuries or illnesses.

- **Lengthy data entry for each incident:** WAFIRS reports may be lengthy and time consuming to enter. Software programs differ in terms of user experience. When rare events occur, such as reporting a firefighter or civilian casualty, the person entering data may encounter unfamiliar elements of the data entry program. These will demand relearning appropriate data entry procedures.
- **Data may not be retained long enough to assist firefighters:** The retention of WAFIRS reports varies by department and is not intended to span the career of personnel or be transferrable between departments or jurisdictions.
- **Centralized data collection may not ensure accurate reporting:** Data entered by company officers or other representative may not accurately characterize the tasks and time of exposure for several individuals responding to an incident.

Personal Injury, Illness, and Exposure Reporting System (PIERS) strengths

- **Captures personal hazardous exposure information as requested by SHB 1604:** The main strength of PIERS is that it allows for personal online entry and access to detailed records of individual exposures. In addition, PIERS is able to capture both self-reported and physician diagnosed injuries and illnesses. PIERS is designed to save and aggregate data that can be readily available to individual users or delivered in summary reports to departments or others upon request.
- **Currently operational and modeled after existing successful system:** PIERS is already operational and is modeled after the existing the California Personal Exposure Reporting System (CA-PER). The CA-PER system is operated by the California Professional Firefighters and has been in operation for more than a decade. Like PIERS, it is an online data entry system for hazardous exposures occurring during the course of firefighting.
- **PIERS is not currently subject to public disclosure:** Because the WSCFF owns and operates PIERS without public funding, the data in PIERS is not subject to public disclosure requirements. If use of the system is mandated or public funding is provided, including work time to complete entries into PIERS, certain records entered into PIERS would be subject to release under public records law; however, some personal information (PI) and personal health information (PHI) records should be exempt from disclosure.
- **Useful for preventing hazardous exposures:**
 - The science of firefighter exposures linked to cancer outcomes is still developing with active research studies being conducted by the National Institute for Occupational Safety and Health. A possible benefit of PIERS data is furthering our understanding of firefighter exposures to harmful substances that lead to poor health outcomes. This goal would require a long-term effort (more than 20 years) of systematic data collection on exposure linked to adverse health outcomes. Data would

need to be collected from a very large number of firefighters to possibly demonstrate a causal association between workplace exposures and health outcomes.

- As an aggregate source of exposure information, the information entered into PIIERS could be used to identify and characterize new, frequent or severe exposure scenarios. A next step could be using PIIERS information to develop hazardous exposure prevention and education materials for firefighters.
- PIIERS is specifically designed to collect detailed personal exposure information entered by individual firefighters. Training on and use of PIIERS by individual firefighters would possibly raise individual awareness of personal exposure frequency, duration and severity and may reduce hazardous exposures through better adherence to safer work practices. Upon the development of a specific illness by an individual PIIERS user, records and information entered into PIIERS may support workers' compensation claims of work-related injury or illness.

PIIERS weaknesses

- **Report quality may vary by firefighter:** PIIERS exposure reports are self-described and self-reported. PIIERS currently does not have quality assurance programs for data entry; there are no checks to estimate or assure consistency in frequency, nature or type of reporting by individuals. In addition, self-reports of injuries or illnesses entered may not be physician-diagnosed. This results in reports comprised of exposure details that are not derived from a uniform naming and coding system, such as the occupational injury and illness classification system (OIICS). For these reasons, records may be considered not valid by health care providers or claims managers who may be charged with reviewing them.
- **Program sustainability:** PIIERS is currently supported by the Washington State Council of Fire Fighters. If the program is mandatory and expanded to include volunteers, additional program funding may need to be identified.
- **Time burden of reporting:** While the actual combined time spent by individuals entering reports into PIIERS is difficult to estimate, it may be perceived as excessive -- especially without a uniformly applied definition and criteria for what constitutes a reportable hazardous exposure, or other limits on the number of reports entered. For example, according to data from the 2010 Fire in Washington report prepared by the Office of the State Fire Marshal, there were a total of about 615,000 incidents reported statewide. When multiplied by the number of responders (estimated at two to four responders per response), this represents reports ranging in excess of one to two million per year.
- **Employer access limited:** Employers would not have direct access to the system or records, and therefore would not consider entering exposure records into PIIERS a work priority unless there was a perceived direct benefit to the employer and employees from PIIERS data.
- **Possible employer retribution for poor work practices:** The possibility that personal information, personal health information or even reports of exposures may be potentially released to employers or others upon public request may inhibit or limit individual reporting. Employee reporting may also be limited by the possibility of the employer taking disciplinary action on an employee not complying with respiratory protection requirements.