

**TACOMA FIRE DEPARTMENT
STANDARDS OF COVER ADDENDUM:
NON-FIRE RISK AND RESPONSE ANALYSIS
June 2009**

BACKGROUND

Purpose of the Addendum

The purpose of this addendum is to provide additional information and clarification relative to Non-Fire risk and response in the Tacoma Fire Department (TFD) service area. The information on Non-Fire risk and response in this addendum, therefore, supersedes the information in the TFD Standards of Cover (SOC) document published in April 2009.

Data Confidence

The April 2009 SOC contained the following statement:

“It also should be noted here that TFD was unable to produce credible, meaningful baseline data for Non-Fire concentration response and as a result, the trends identified based on this data may not be completely accurate. Non-Fire performance standards, therefore, were set based on anecdotal data and guidance from TFD personnel with expertise in these disciplines and may need to be adjusted in the future as data reliability improves.”

To clarify, Non-Fire concentration response data was available throughout the SOC development process. The concern that led to its omission in the April 2009 document was that there were an insufficient number of incidents to establish an accurate baseline from which to set a reasonable benchmark.

In this addendum the concern about low incident numbers has been set aside and the response data presented and analyzed as is. The benchmarks and performance standards have been adjusted as deemed necessary based on the baseline data.

Additional Clarification

The Marine response area encompasses 44 miles of shoreline bordering 25 square miles of saltwater. For the purposes of this document, the baseline and benchmark response data as well as the performance standard is based on reasonable travel time to the farthest distance within the Marine response area.

The Hazardous Materials (HazMat) incident data reported in the April 2009 SOC document reflects hazardous condition calls as well as actual HazMat incidents that required operations/technician level response. This made sense at the time given the initial concerns about low incident numbers. In this document, however, only the operations/technician level response incident data is presented to ensure consistency between the baseline and benchmark measures and the performance standard for HazMat response.

Tech Rescue is a relatively new program for TFD that has struggled with leadership and team working relationship issues since its formal inception in 2006. The escalation of those issues over time led to a “stand down” of the Tech Rescue program for most of 2008. During that time the program was reassessed, new team members and leadership were recruited and personnel were retrained. TFD continued to respond to potential tech rescue incidents during the stand down with the on-scene incident commander deciding on the need for additional resources including TFD’s HazMat team and/or the Pierce County Special Operations Response Team (PCSORT). The reinstatement of the TFD Tech Rescue program was incremental, beginning with rope rescue in December 2008 followed by confined space and trench rescue in May 2009.

The April 2009 SOC document contained 2006-2008 incident data that upon further review for this addendum, together with the previous input from TFD subject matter experts during the SOC development process, confirmed that, at least anecdotally, not all incidents were accounted for. In addition, the definition of an effective response force for Tech Rescue was not consistent in the years for which data is available, further contributing to the data confidence concerns.

Given these issues TFD is requesting to withdraw the Technical Rescue program from Standards of Cover and self-assessment at this time. The intent is to apply the principles of self-assessment now and then set performance standards in 2010 after the newly launched program completes its first year of operation. That information will be included in the first and subsequent annual compliance reports, assuming accreditation is granted. By the time re-accreditation occurs, the Tech Rescue program should have five solid years of reliable data to present for consideration.

NON-FIRE RISK ANALYSIS

Table 1 shows the number of Marine incidents by year and type. Table 2 shows the number of HazMat incidents by year and by planning zone. The top 3 incident types for Marine and the top 4 zones for HazMat incidents are highlighted in yellow.

Table 1: Frequency - Marine Firefighting and Rescue Incidents							
Incident Type	2003	2004	2005	2006	2007	2008	Type total
Fire	22	21	7	19	17	13	99
Rupture/Explosion	0	1	1	0	0	0	2
HazMat	2	0	0	0	1	3	6
EMS patient	6	8	14	19	30	19	96
Search and/or Rescue	8	5	5	6	3	2	29
Hazardous Condition	0	0	3	5	4	2	14
Annual total	38	35	30	49	55	39	246

Table 2: Frequency - HazMat Incidents							
Zone	2003	2004	2005	2006	2007	2008	Zone total
Downtown	4	3	6	2	3	8	26
Eastside	2	4	1	2	1	2	12
Fircrest							
Fife/ Fire District 10	3	9	2	3	3	8	28
North End	1	1	5	1	3	1	12
Northeast Tacoma			2	1	1		4
South Central	1	2	2	1	1	3	10
South End	5	2	1	1	1	1	11
South West	9	4	9	1	4	5	32
Tideflats	6	12	11	8	18	11	66
Upper Tacoma	2	1	5	2	4	1	15
West End	1	3	1	2	1	1	9
Annual total	34	41	45	24	40	41	225

Overall analysis of Non-Fire risk was conducted according to the following criteria:

- Population
- Number of Non-Fire incidents
- Presence of--
 - Geographical and/or access issues (G/A)
 - Wildland/urban interface (W/U)
 - Critical infrastructure (CI) -- utilities, transportation, health, education, government
 - Heavy industry (IND)
 - Potential for significant economic impact (EI)
 - Historical/cultural value (HV)

The zone-by-zone Non-Fire risk analysis based on the above criteria is shown in Table 3. The top 4 zones for incidents and/or presence of one of the other criteria are highlighted in yellow.

Table 3: Zone-by-Zone Non-Fire Risk Analysis									
Zone	Pop. Total/ Density	Incidents		Presence of					
		Marine	Haz Mat	G/A	W/U	CI	IND	EI	HV
Downtown	9,199/ 2,652	n/a	26	no	no	yes	no	yes	yes
Eastside	21,775/ 4,528	n/a	12	yes	yes	yes	no	yes	yes
Fircrest	5,903/ 3,625	n/a		no	no	yes	no	yes	no
Fife/Fire District 10	7,064/ 917	n/a	28	yes	yes	yes	yes	yes	no
North End	24,292/ 2,236	n/a	12	yes	yes	yes	no	yes	yes
Northeast Tacoma	16,118/ 3,349	n/a	4	yes	yes	yes	no	no	no
South Central	17,894/ 6,127	n/a	10	yes	yes	yes	no	yes	no
South End	26,878/ 5,353	n/a	11	yes	yes	no	no	no	no
South West	23,218/ 3,057	n/a	32	yes	yes	yes	yes	yes	no
Tideflats	727/ 69	n/a	66	yes	yes	yes	yes	yes	no
Upper Tacoma	26,333/ 5,643	n/a	15	no	no	yes	no	yes	yes
West End	27,366/ 3,596	n/a	9	yes	yes	yes	no	yes	no

Based on all of the preceding information, the following conclusions can be drawn regarding Non-Fire risk in the TFD service area:

- Planning zones with highest HazMat risk based on the number of incidents are Southwest, Tideflats and Fife/Fire District 10; all of which also have 5 of 6 other risk indicators
 - This is consistent with the presence of high risk structures and activities detailed in the zone-by-zone risk analysis in the April 2009 SOC document
- Downtown also is high risk based on then number of incidents
- Planning zones with the lowest Non-Fire risk
 - Fircrest - has 2 of 6 other risk indicators
 - NE Tacoma - has 3 of 6 other risk indicators

NON-FIRE EMERGENCY RESPONSE ASSESSMENT

All of the comparable response standards listed on pages 69-71 of the April 2009 SOC document were used in this assessment.

Concentration

Concentration measures used for this analysis are as follows:

Marine - 40 minutes 70% of the time

Hazardous Materials - 20 minutes 70% of the time

TFD performance against these standards is shown on Tables 4 and 5. Zones without any percentages noted did not have any incidents. The zones with travel times below standard are highlighted in yellow. Planning zones do not apply to Marine data.

Table 4: Concentration - Hazardous Materials							
Zone	2003	2004	2005	2006	2007	2008	Zone %
Downtown			0%		50%	33%	33.3%
Eastside		100%	0%		0%		33.3%
Fircrest							
Fife/Fire District 10	0%	100%		100%		100%	75%
North End			100%	0%			50%
Northeast Tacoma			0%				0%
South Central			0%		0%		0%
South End	50%	0%				0%	25%
South West	0%		33%		0%		12.5%
Tideflats	33%	20%	67%	100%	67%	33%	50%
Upper Tacoma	0%						0%
West End							
Annual %	20%	38%	36%	67%	47%	38%	38.2%

Table 5: Concentration - Marine							
	2003	2004	2005	2006	2007	2008	6 year overall %
Overall	94%	91%	82%	100%	93%	78%	91%

Based on the preceding data, the following conclusions can be reached about Non-Fire response:

- Marine concentration response is well above the 70% standard
- The drop in 2008 is attributed to the fireboat retrofit project. During that time, TFD had to rely on the old fireboat for Marine response. That boat has mechanical limitations that impact travel speeds. The new boat is now in operation and response improvement is expected for 2009.
- HazMat response is substandard in all planning zones, except Fife/Fire District 10

For the purposes of this document, overall response analysis includes the following:

- 2008 Distribution response - all emergency responses, excluding Marine (DIST)
- 2008 Concentration response - Fire (low, moderate and high risk fires)
- 2008 Concentration response - EMS (ALS and ALS with extrication)
- 2008 Concentration response - HazMat

The reliability data cited on page 84 of the April 2009 SOC document still stands even though it is not reflected in this document.

The zone-by-zone response analysis based on the above criteria is shown in Table 6. The zones with substandard response are highlighted in yellow.

Table 6: Zone-by-Zone Response Analysis							
ZONE	DIST	CONCENTRATION					
	≥70%	Fire ≥ 70%			EMS ≥90%		Non-Fire ≥70%
		H	M	L	ALS	ALSE	HazMat
Downtown	94.7%	93.3%	96.9%	94.1%	94.5%	85.9%	33.3%
Eastside	90.7%	100%	96.0%	94.5%	87.7%	85.7%	33.3%
Fircrest	91.3%	--	90.5%	95.0%	78.8%	100.0%	--
Fife/Fire District 10	98.5%	86.7%	86.4%	95.6%	84.0%	76.3%	75.0%
North End	91.2%	100%	89.8%	93.7%	81.2%	84.6%	50%
Northeast Tacoma	78.5%	100%	78.6%	93.0%	17.8%	72.7%	0%
South Central	96.4%	92.3%	95.9%	93.9%	93.6%	85.7%	0%
South End	89.1%	100%	95.7%	92.0%	77.2%	66.7%	25%
South West	92.7%	89.5%	95.1%	92.8%	82.7%	80.5%	12.5%
Tideflats	69.8%	79.2%	95.7%	90.5%	81.2%	68.6%	50%
Upper Tacoma	96.8%	87.0%	97.2%	95.4%	95.0%	89.2%	0%
West End	92.6%	100%	95.5%	94.6%	85.1%	69.8%	--

Based on all of the preceding information, the following conclusions can be drawn regarding TFD response:

- TFD clearly meets the minimum CFAI distribution response standard in all planning zones, except the Tideflats
- Although the distribution time standard is being met in Northeast Tacoma, the response to that zone is significantly lower than for other planning zones

- TFD consistently exceeds the minimum CFAI concentration response standard for all types of Fire in all planning zones
- Both ALS concentration and ALS response with extrication are substandard and declining in most planning zones
- Marine concentration response is well above the 70% standard
- HazMat response is substandard in all planning zones, except Fife/Fire District 10

PERFORMANCE STANDARDS

TFD has established the following baselines and benchmarks for ongoing department performance monitoring relative to Non-Fire response. Keeping in mind the financial realities of being a municipal department and the fact that this more structured approach to performance monitoring is new to TFD; benchmarks have been set to either maintain the 2008 response levels or to achieve a desired level of response. As TFD gains more experience with the discipline of ongoing performance monitoring and information systems issues are addressed to improve data collection, benchmarks will be adjusted accordingly through an annual review process. Table 7 details the specific Non-Fire baseline and benchmark measures for travel time and for Marine turnout. Dispatch and turnout measures for other Non-Fire response remain unchanged from what appears on page 86 of the April 2009 SOC document.

Table 7: Baselines and Benchmarks				
Measure	Standard		Baseline	Benchmark
	Min:Sec	%	%	%
Concentration - Marine Firefighting and Rescue	40:00	70%	91% ¹	90%
Concentration - Hazardous Materials	20:00	70%	38.2%	70%

¹ 6 year overall percentage

When all of the above response elements are combined, TFD is committed to the following levels of service to **reduce preventable life and property loss²**:

Concentration - Marine Firefighting and Rescue

TFD shall arrive in a timely manner with personnel sufficiently trained and equipped to initiate rescue efforts to prevent life and property loss and/or mitigation efforts to prevent environmental damage while providing for the safety of responders.

For 90% of all Marine firefighting and rescue calls, the TFD fireboat, staffed with a minimum of 3 personnel, shall arrive within 42 minutes, 30 seconds total response time.

Concentration - Hazardous Materials (HazMat)

TFD shall arrive in a timely manner with personnel sufficiently trained and equipped to stabilize and control access to the incident scene, identify and evaluate hazards and isolate or evacuate casualties, while protecting the safety of responders and/or additional adverse impact to the environment.

For 70% of all HazMat incidents requiring operations/technician level response, the effective response force consisting of one engine and one ladder plus Engine 12 and Ladder 4 and a minimum of 12 personnel, shall arrive within 22 minutes, 30 seconds total response time.

RESOURCE ANALYSIS AND RECOMMENDATIONS

The following recommendations are offered as a means to improve Non-Fire response:

Marine

- Given the water temperature and inherent hypothermia risk, the Marine response area should be divided into three planning zones; Commencement Bay to include Thea Foss Waterway, the Tideflats waterways and the Narrows
 - This improvement in Marine response data collection will require the development of longitudinal and latitudinal location identification capability within TFD's incident reporting system (IRS)

² TFD Strategic Plan 2008-2012

- Renovate Station 5 and re-locate the fireboat to that site
 - Response time improvement to most of the Marine response area is not possible without fireboat relocation
- Consider full-time fireboat staffing for existing crew and the addition of a full-time 4th person with ALS capability
 - 4th person increases firefighter safety and operational efficiency
 - Creating ALS capability is supported by data on demand for EMS and search/rescue
- Create back-up Marine response capability in the form of a reserve fireboat and/or rapid response vessel (RRV) for use when significant pumping capability is not required

Hazardous Materials

- Consider maintaining minimum staffing of 3 technicians on duty every day
- Modify the Incident Reporting System (IRS) to improve data gathering capability
- Maintain ongoing training at awareness level due to heavy reliance on operations personnel for HazMat response

IMPLEMENTATION PLAN

Staffing recommendations will be considered as part of the department's established budget process and may be presented for consideration in the City's 2009 mid-biennium budget adjustment and subsequent biennial budgeting processes; the next of which begins in 2010.

Facility recommendations will be integrated into the facilities master planning process slated for completion in 2009.

The technology-based opportunities to improve Non-Fire response data will be addressed as part of the department's information systems master planning process slated for completion by the end of 2009.

The recommendations for ongoing training and education for operations personnel, both for response and data reporting, will be referred to the TFD Training Division for inclusion in the overall training plan scheduled for completion by the end of 2009.