

# THREE: APPENDICES

## MISCELLANEOUS ASSUMPTIONS

*continued*

### ***Duty-Related Death***

#### **What is the Duty-Related Death Assumption and How Do We Use it?**

The Duty-Related Death assumption represents the likelihood that a member dies during or after the course of employment and receives certain duty-related death benefits.

Survivors of active members who suffer a duty-related death receive a one-time lump sum as well as a subsidized survivor annuity. Survivors of inactive members receive only the one-time lump sum benefit, provided the member died due to an occupational disease or infection that arose out of employment.

The survivor annuity is considered subsidized because it does not require any early retirement reductions from the time of the member's death. The survivor annuity is further subsidized in LEOFF and WSPRS because no Joint-and-Survivor reduction is applied. Survivors in LEOFF and WSPRS may also be eligible to receive reimbursement from the pension system for future medical premiums.

In addition to the survivor annuity, the lump sum payment is as follows:

- ❖ \$150,000 for PERS, TRS, SERS, and PSERS.
- ❖ \$214,000 for LEOFF and WSPRS, indexed for inflation each year beginning in 2008 (\$251,352.50 as of July 1, 2018).

#### **High Level Takeaways**

Our ability to review this assumption for accuracy is limited given the infrequent occurrence of duty-related deaths. Many systems experienced fewer duty-related deaths than expected under our old assumption. As such, we reduced our duty-related death assumption for all systems except LEOFF and WSPRS. The WSPRS assumption remains unchanged and we increased our assumption for LEOFF primarily because recent legislation continues to expand the duty-related death provisions. Additionally, we simplified our approach to modeling the occupational disease duty-related death benefits for LEOFF.

To get a sense of scale for these benefits, under our old assumptions LEOFF 2 and WSPRS 1/2 duty-related death benefits represent approximately 0.6 percent and 0.2 percent of the present value of future benefits for these plans, respectively. By comparison, all other plans comprise less than 0.02 percent.

We also reviewed the ages at which members died from duty-related causes and did not identify a consistent pattern. This means the observed duty-related death rate for a 50-year-old member was similar to that of a 30-year-old member. For this reason, we assumed the same duty-related death rate across all ages.

#### **Data and Assumptions**

The Legislature expanded duty-related death provisions in March 1996 for LEOFF plans and July 2003 for all other plans to include an automatic lump sum benefit. Previously, surviving beneficiaries had the option to elect a lifetime monthly benefit or a refund of member contributions. The data available prior to the expansion only reflect the election of a lifetime benefit, and not the true incidence of duty-related deaths. We therefore excluded data prior to 2004 for all non-LEOFF plans in our analysis.

The LEOFF duty-related death provision was again expanded by the Legislature in 2006 to include members who die from occupational disease. To account for this, we excluded all data prior to the 2006 expansion for LEOFF 2.

We used the new Mortality Rates assumption when applying the new duty-related death assumption to our valuation software.

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### General Methodology

We began by comparing our old assumption to historical data. Given the limited number of observations, our goal was to assess the reasonableness of the old assumption, and, if necessary, move our future expectations in the direction of the actual experience. We also applied our judgment to establish relationships between retirement systems based on similar patterns of experience.

For information about the old assumption, please see the [2007-2012 Demographic Experience Study](#).

### Law Changes

#### ❖ **SSB 6214 (2018).**

- o Applied to members of LEOFF.
- o This law expanded the lump sum duty-related death benefit to cover Post-Traumatic Stress Disorder (PTSD).

#### ❖ **HB 1913 (2019).**

- o Applied to all members of LEOFF and select members of PERS.
- o This law expanded the statutory list of presumptive occupational diseases for fire fighters. It also adds some law enforcement, publicly employed EMTs, and fire investigators to the list of workers covered by the occupational disease presumption.

### Analysis and Results

#### Analysis

#### **Past Experience**

The following table identifies the number of duty-related deaths by retirement system over the relevant experience study period.

System	Observations 2004-2017
PERS	26
TRS	3
SERS	2
PSERS	0
LEOFF 2*	55
WSPRS	3

*\*Excludes 2004 and 2005.*

Focusing in on the systems or plans with the most events, PERS and LEOFF 2, the following tables show the Actual and Expected counts by year, along with the A/E ratio for the total across all years. The Expected counts are based upon our old assumptions.

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PERS Duty-Related Deaths			
Year	Lives	Expected	Actual
2004	156,117	2.8	3
2005	157,691	2.8	4
2006	157,109	2.8	0
2007	156,473	2.8	5
2008	159,370	2.9	1
2009	162,771	2.9	2
2010	160,646	2.9	4
2011	157,723	2.8	4
2012	153,929	2.8	1
2013	152,002	2.7	0
2014	152,240	2.7	0
2015	153,663	2.8	0
2016	154,794	2.8	1
2017	157,209	2.8	1
<b>Total</b>	<b>2,191,737</b>	<b>39.5</b>	<b>26</b>
<b>A/E 0.66</b>			

LEOFF 2 Duty-Related Deaths			
Year	Lives	Expected	Actual
2006	15,975	5.6	6
2007	16,379	5.7	3
2008	16,695	5.8	5
2009	17,122	6.0	11
2010	17,388	6.1	4
2011	17,303	6.1	5
2012	17,110	6.0	2
2013	16,948	5.9	5
2014	16,881	5.9	2
2015	16,953	5.9	6
2016	17,151	6.0	2
2017	17,422	6.1	4
<b>Total</b>	<b>203,327</b>	<b>71.2</b>	<b>55</b>
<b>A/E 0.77</b>			

The expected columns in the previous tables reflect the number of duty-related deaths we assumed each year for active members. Survivors may still receive a duty-related death benefit if the member passes away after leaving the workforce, as long as the death is due to an occupational disease (or rather, a duty-related illness). This is most prevalent for LEOFF survivors as the list of occupational diseases for LEOFF members is much larger than the rest of the systems given the increased risks these members face as part of their job. Furthermore, there is a presumption in place that if a LEOFF member dies from one of the listed diseases within five years of leaving active service<sup>1</sup>, it will result in the payment of a duty-related death benefit.

The actual columns in the previous tables reflect all duty-related death benefit payments, regardless of the member's employment status (active, retired, etc.) when the death occurred. While we also model duty-related death benefits paid to survivors of current inactive members that left service in the last five years, we excluded those expected figures from the previous tables. For more information, please see the **Results** sub-section.

<sup>1</sup>The occupational disease presumption window is provided to all members (who disable, terminate, or retire) and equals three months per year of plan membership or five years, whichever is less. While survivors are still eligible for duty-related benefits for deaths that occur beyond the presumptive window, it requires more evidence to prove the death was due to occupational disease.

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### **Methods and Format of Assumptions**

We considered alternate formats for the assumptions and, ultimately, decided not to make any changes. For reference, we considered, but did not adopt:

❖ **Separate assumptions for police and fire members of LEOFF.**

Given the similar demographics of the average police and fire members and the same benefit provisions for active duty-related death benefits, we did not feel a separate assumption was necessary. While other factors, like the nature of the job, may result in higher or lower likelihood of a duty-related death, for simplicity we feel attempting to model the expected aggregate number of deaths across the system is sufficient and reasonable.

❖ **Separate assumption for inactive members of non-LEOFF plans.**

We have only observed five duty-related deaths in PERS inactive members since 2004. We will continue to monitor this assumption and plan to review it again as part of the next experience study.

### **Results**

The following table shows our old assumption, the actual rate, and our new duty-related death assumption for active members in each system.

System	Old Rate	Actual Rate*	New Rate
PERS	0.0018%	0.0012%	0.0015%
TRS	0.0008%	0.0003%	0.0005%
SERS	0.0018%	0.0003%	0.0005%
PSERS	0.0018%	0.0000%	0.0015%
LEOFF 2	0.0350%	0.0271%	0.0450%
WSPRS	0.0200%	0.0203%	0.0200%

*\*Based upon historical experience from 2004-17; 2006-17 for LEOFF 2.*

Most systems experienced fewer duty-related deaths than expected under our old rates. We therefore reduced this assumption for most systems.

While historical experience was less than expected for LEOFF 2, we increased our assumption as a result of recent legislation. Based on our analysis for those bills, we assumed an additional four deaths per year would now fall under the duty-related death category. Taking that into account when reviewing the actual to expected historical experience, we increased our LEOFF 2 assumption for both actives and inactives.

- ❖ For current inactive members who left service within the past five years, we model the expected number of occupational disease deaths per year. We adjusted both our assumption and methodology for the portion of duty-related deaths within this window to primarily account for recent legislation. For reference, we observed 11 occupational disease deaths over the last 12 years. Taking all this into consideration, we estimate four additional deaths due to occupational disease over the next five years, which by itself would increase our assumption; however, the number of eligible members expands to include law enforcement officers. As a result, we modified our assumption to now be applied to both fire fighters and law enforcement officers. The next effect is change in assumption from 27.2924 percent to 13 percent.

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The analysis showed a downward trend in duty-related deaths for PERS in recent years, which may be due to improvements in technology and/or an emphasis on job safety. However, we did not feel comfortable reducing our old assumption to match historical experience given the limited data. Our new assumption for PERS yields an A/E ratio of 0.79 over the time period studied, up from 0.66. We will continue to adjust the assumption in future studies if experience continues to follow the recent downward trend. The 2019 Legislation is not expected to notably increase the number of duty-related deaths in PERS.

For SERS, we chose to set our new assumption equal to TRS given the similar working conditions and similar incidence rates; we considered moving part way from the old SERS assumption, which was equal to PERS, but decided the significant shift was reasonable given the small impact of the assumption change.

For the remaining public safety plans, we continue to set the PSERS assumption equal to PERS as we do not believe PSERS will exhibit the same levels of duty-related deaths as the other public safety plans. We did not directly review LEOFF 1 experience since these benefits do not materially impact estimated plan costs; we continue to set this assumption equal to LEOFF 2. Finally, we made no change to the WSPRS assumption given actual experience closely mirrored our prior expectations.