

# THREE: APPENDICES

## MISCELLANEOUS ASSUMPTIONS

*continued*

### ***Duty Disability Probability***

#### **What is the Duty Disability Probability Assumption and How Do We Use it?**

The Duty Disability Probability assumption for LEOFF 2 represents the probability that a member disables from active service due to a duty-related cause.

We apply the duty disability probability to the Disability Rates to estimate the number of active members that will disable from duty-related causes and collect a lifetime retirement benefit. Members who experience a duty-related disabling event and select retirement typically receive a larger retirement benefit than they would otherwise, either through service retirement or a non-duty-related disability retirement. We set the duty disability probability assumption as a percent of all disabled retirements.

The example below illustrates the calculation of the number of duty-related disablements for 100 LEOFF 2 active members age 45 using the new assumption.

$(100 \text{ active members}) \times (0.002 \text{ Total Disability Rate}) \times (0.90 \text{ Duty-Related Probability}) = 0.18$

#### **High Level Takeaways**

Previously, we set age-based assumptions for the duty disability probability, and with this study, we simplified our approach and set a single rate for all ages and job classifications. We found that the complexity of by-age rates did not significantly change results. We also previously set different assumptions for both law enforcement officers and firefighters. However, data shows that law enforcement officers and firefighters disable from duty-related causes at similar rates. For information about the prior assumption, please see the [2007-2012 Demographic Experience Study](#).

#### **Data and Assumptions**

We looked at 23 years of experience study records, from 1995-2017. No special data was added for this assumption, but some data was removed. We excluded data prior to 2005 due to significant changes in benefits after that point.

We used the new total disability assumption described in the **Disability Rates** section to set the duty disability probability assumption. We compared the actual number of duty-related disabilities with what our new assumptions produced over our study period.

#### **General Methodology**

We compared the number of actual duty-related disablements (observations) to our expected number of duty-related disablements based on our old assumed rates. To determine the expected number, we applied the old duty-related probability with the old total disability assumption to the eligible population over the study period, by age. This helped us identify trends in the data where the assumption was over- or underestimating disabled retirement experience. We then performed the same calculation using the new total disability assumption, developed as part of this experience study, to determine its impact. To set the new assumed probability, we divided observed duty disabled retirements by all observed disabled retirements, by-age, over five-year age bands and in aggregate.

#### **Law Changes**

The laws listed below expanded access to duty-related disability benefits for LEOFF 2 members. We considered their potential impact when setting assumptions.

- ❖ **[HB 2592 \(2016\)](#)** – Allows disability coverage for LEOFF 2 members that become totally incapacitated as a result of certain federal emergency management service.
- ❖ **[SSB 6214 \(2018\)](#)** – Adds Post-Traumatic Stress Disorder (PTSD) to the list of occupational diseases and creates a rebuttable presumption for LEOFF members that PTSD is an occupational disease.
- ❖ **[HB 1913 \(2019\)](#)** – Allows the presumption of occupational disease for purposes of workers' compensation by certain adding medical conditions to the presumption.

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### Analysis and Results

#### Analysis

#### **Past Experience**

The following table shows the actual to expected counts under the old duty disability probability when it is applied to both the old and new total disability assumptions. We found that the underlying total disability rates account for most of the change in expected duty disabled retirements because the majority of disabled retirements in LEOFF 2 are duty-related.

Plan 2 Duty Disability Counts by Age					
Old Duty Disability Probability					
Age	Old Total Disability Rates			New Total Disability Rates	
	Actual	Expected	Ratio	Expected	Ratio
20-24	0	0	0.00	0	0.00
25-29	1	4	0.24	1	0.72
30-34	4	15	0.27	5	0.79
35-39	19	34	0.55	33	0.58
40-44	34	53	0.64	35	0.97
45-49	39	71	0.55	62	0.63
50-54	88	93	0.95	93	0.94
55-59	64	78	0.83	70	0.92
60-64	22	38	0.58	24	0.92
65+	2	3	0.58	2	1.24
<b>Total</b>	<b>273</b>	<b>390</b>	<b>0.70</b>	<b>325</b>	<b>0.84</b>

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

We considered alternate formats for the assumptions and, ultimately, decided to simplify the duty disability probability to a single rate for all ages. For reference, we considered, but did not select:

- ❖ **Separate assumptions for law enforcement officers and firefighters.**

The data shows a small difference in the by-age and aggregate duty disablement percentages between law enforcement officers and firefighters. However, that difference is small and does not materially add to the accuracy of our model.

- ❖ **Assumptions that vary by age.**

We considered setting this assumption similarly to that of total disability rates. While this approach does more accurately reflect the data, we believe it does not materially add to the accuracy of our model.

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### Results

Experience shows high rates of duty-related disablement at earlier ages, trending downward as age increases. In general, actual rates compared closely to the old rates. With consideration for the materiality and complexity of the assumption, we applied professional judgement to set a single rate for all ages. To account for recent passed legislation, we upwardly adjusted the single rate greater than average historical observations.

Plan 2 Disability Counts by Age			
New Total Disability Rates and New Duty Disability Probability			
Age	Actual	Expected	Ratio
20-24	0	0	0.00
25-29	1	1	0.81
30-34	4	5	0.87
35-39	19	30	0.64
40-44	34	33	1.04
45-49	39	60	0.65
50-54	88	93	0.95
55-59	64	71	0.90
60-64	22	24	0.90
65+	2	2	1.22
<b>Total</b>	<b>273</b>	<b>319</b>	<b>0.86</b>

LEOFF Plan 2 Duty Disability Probability	
All Ages	90%