

Administrative Factors

$$\int \frac{x^2 \sqrt{x^2 \pm a^2}}{x^2} dx = \frac{1}{5} (2x^2 \pm a^2) \sqrt{x^2 \pm a^2} - \frac{a^2}{5} \ln|x + \sqrt{x^2 \pm a^2}| + C$$

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Presentation to:
LEOFF 2 Board

The background features a collage of mathematical content. On the left, several integral formulas are listed, including:

$$\int \frac{\sqrt{x^2 - a^2}}{x} dx = \sqrt{x^2 - a^2} - a \sec^{-1} \frac{x}{a} + C$$

$$\int \frac{x^2 \sqrt{x^2 \pm a^2}}{x^2} dx = \frac{1}{5} (2x^2 \pm a^2) \sqrt{x^2 \pm a^2} - \frac{a^2}{5} \ln|x + \sqrt{x^2 \pm a^2}| + C$$

$$\int \frac{x^2}{\sqrt{x^2 \pm a^2}} dx = \frac{x}{2} \sqrt{x^2 \pm a^2} \mp \frac{a^2}{2} \ln|x + \sqrt{x^2 \pm a^2}| + C$$

$$\int \frac{\sqrt{x^2 \pm a^2}}{x^2} dx = \frac{\sqrt{x^2 \pm a^2}}{x} \mp \frac{a^2}{2} \ln|x + \sqrt{x^2 \pm a^2}| + C$$

$$\int \frac{dx}{\sqrt{x^2 \pm a^2}} = \ln|x + \sqrt{x^2 \pm a^2}| + C$$

$$\int \frac{dx}{(x^2 \pm a^2)^{3/2}} = \frac{x}{a^2 \sqrt{x^2 \pm a^2}} \mp \frac{1}{a^2} \ln|x + \sqrt{x^2 \pm a^2}| + C$$

$$\int \frac{dx}{(x^2 \pm a^2)^{5/2}} = \frac{x}{8a^4 \sqrt{x^2 \pm a^2}} \mp \frac{3x}{8a^4} \ln|x + \sqrt{x^2 \pm a^2}| + \frac{3a^2}{8a^4} \ln|x + \sqrt{x^2 \pm a^2}| + C$$
 On the right, there are trigonometric relationships:

$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$r^2 = x^2 + y^2$$

$$-a \leq x^2 + y^2 \leq -a$$

$$-4 \sin \theta \leq \theta \leq -6 \sin \theta$$

$$-6 \sin \theta$$

$$r = \frac{a}{\cos \theta}$$

$$dr = \frac{a \sin \theta}{\cos^2 \theta} d\theta$$

$$4 - r^2 + a^2 = 6C$$
 In the center, there is a 3D geometric diagram of a cube with vertices labeled A through H.

Office of the State Actuary
"Supporting financial security for generations."

September 21, 2016

Today's Presentation

- Background information
- New factor comparison
- Recommendation
- Next steps



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Office of the State Actuary

Background – What Are Administrative Factors?

- Administrative factors adjust pensions for optional payment forms
 - Optional payments should be cost-neutral to the plan as a whole - “Actuarial Equivalence”
- Best actuarial equivalence includes all eligible members in the development of the factors

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Background – Why Is This Before The Board?

- The Board has authority to adopt factors for LEOFF 2
 - DRS adopts factors for all other plans
- SSB 6264 passed in 2016 Session and provides LEOFF 2 retired members with a one-time opportunity to purchase additional annuity
 - Actuarial Fiscal Note assumes actuarial equivalent administrative factors
- Two different administrative factors used for annuity purchase
 - Annuity purchase factors are based on age at purchase and payable for the members’ lifetime
 - Joint and Survivor (J&S) factors convert the single life annuity so it’s payable on the life of both the member and their beneficiary
 - Current factors are not actuarially equivalent since they are based on average age at retirement, not average age of current retirees



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Joint & Survivor Option Factors

- J&S factors reduce a member's benefit to provide an ongoing benefit for their survivor
- Three types of survivor benefits available under the plan:
 - J&S 100 percent
 - J&S 50 percent
 - J&S 66 2/3 percent
- New factors needed for retired members
 - Current J&S factors are based on members at retirement
 - Members electing J&S option after retirement need larger reduction since the cost to provide an ongoing survivor benefit increases as the member ages

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Administrative Factors Include Policy Decisions Of The Board

- Incorporate mortality improvement trends
- Blend male and female mortality rates
- Blend healthy and disabled mortality rates



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Joint & Survivor Factor Comparison

- J&S factors vary based on the member's age and the age of their joint annuitant when the benefit commences
- Compares the value of a single life annuity to a joint life annuity
- J&S factors reduce a member's benefit to recognize additional cost of providing a benefit payable on two lives

Percent Change From 2015 'At Retirement' Factors			
	J&S 100%	J&S 50%	J&S 66.67%
MIN	(0.94%)	(0.48%)	(0.64%)
AVG	(4.94%)	(2.84%)	(3.60%)
MAX	(8.49%)	(5.11%)	(6.38%)

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Joint & Survivor Factor Example

- Impact on \$2,000 additional monthly retirement benefit purchased by a 65 year old member electing J&S 100 percent (age difference = 3)

	Current	New	Change
J&S Factor	0.855	0.822	(3.93%)
Monthly Benefit	\$1,710	\$1,644	(\$66)

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Recommendations

- We recommend adopting new J&S administrative factors to apply to current retired members who purchase an additional annuity
 - Best estimate of life expectancies for impacted members
 - Best actuarial equivalence (accuracy) for cost of optional benefits
 - Consistent with assumptions used in the actuarial valuation to determine funding requirements of the plan
 - Consistent with the analysis prepared for SSB 6264

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Next Steps

- OSA has provided additional information and tables of new factors
 - Used for members in retirement electing to purchase additional annuity
 - Current J&S factors remain for members electing a survivor option at the time of retirement
- Board adopts final factors
- DRS will use new factors during the temporary window, January 1, 2017 through June 1, 2017



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Questions?



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