

Actuarial Information 101

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Today's Topics

- Overview of important pages
- Answers to the most common questions
- Two sections
 - Non pooled
 - Pooled

Non Pooled Plans

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Non-Pooled Report – Common Questions

- What is my rate?
- Is my plan in good shape?
- Why did my rate change?
- Where is my rate headed?
- Where are my PEPRA members?
- What else should I be worried about?

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Non-Pooled Plans

- What is my rate? - Cover page

Fiscal Year	Employer Contribution Rate
2016-17	21.133%
2017-18	23.2% (projected)

- Rates do not reflect any cost sharing information
- Fiscal Year 2017-18 projection reflects
 - 1st year impact of 2014-15 investment return 2.4%

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Non-Pooled Plans

- What is my rate? – Page 4

Required Employer Contribution

	Fiscal Year 2015-16	Fiscal Year 2016-17
Actuarially Determined Employer Contributions		
1. Contribution in Projected Dollars		
a) Total Normal Cost	\$ 3,965,277	\$ 4,125,801
b) Employee Contribution ¹	1,714,390	1,778,389
c) Employer Normal Cost [(1a) – (1b)]	2,250,887	2,347,412
d) Unfunded Liability Contribution	2,596,180	3,035,325
e) Required Employer Contribution [(1c) + (1d)]	\$ 4,847,067	\$ 5,382,737
Projected Annual Payroll for Contribution Year	\$ 24,508,792	\$ 25,471,050
2. Contribution as a Percentage of Payroll		
a) Total Normal Cost	16.179%	16.198%
b) Employee Contribution ¹	6.995%	6.982%
c) Employer Normal Cost [(2a) – (2b)]	9.184%	9.216%
d) Unfunded Liability Rate	10.593%	11.917%
e) Required Employer Rate [(2c) + (2d)]	19.777%	21.133%
Minimum Employer Contribution Rate²	19.777%	21.133%
Annual Lump Sum Prepayment Option ³	\$ 4,674,927	\$ 5,191,573

- Components of the employer rate
- PEPRA minimum rate
- Lump sum prepayment

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Non-Pooled Plans



- New for FY 2017-2018
- Employer Contribution comprised of 2 components
 1. Normal Cost Rate (% of Salary)
 2. UAL \$ Amount
- Example
 1. Normal Cost Rate 9.261%
 2. UAL Payment \$3.7 million

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Non-Pooled Plans

- Is my plan in good shape? – Page 4

Plan's Funded Status

	June 30, 2013	June 30, 2014
1. Present Value of Projected Benefits	\$ 253,480,870	\$ 272,658,602
2. Entry Age Normal Accrued Liability	228,267,503	246,141,609
3. Market Value of Assets (MVA)	\$ 178,118,108	\$ 200,603,777
4. Unfunded Liability [(2) – (3)]	\$ 50,149,395	\$ 45,537,832
5. Funded Ratio [(3) / (2)]	78.0%	81.5%

- Unfunded Liability = UAL = Unfunded Accrued Liability
- Funded Ratio is one indicator of the plan's health
- Information as of June 30, 2014

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Non-Pooled Plans

- Why did my rate change? – Page 13

(Gain) /Loss Analysis 6/30/13 – 6/30/14

A Total (Gain)/Loss for the Year		
1. Unfunded Accrued Liability (UAL) as of 6/30/13	\$	50,149,395
2. Expected Payment on the UAL during 2013/2014		1,337,830
3. Interest through 6/30/14 $[.075 \times (A1) - ((1.075)^n - 1) \times (A2)]$		3,711,943
4. Expected UAL before all other changes $[(A1) - (A2) + (A3)]$		52,523,508
5. Change due to plan changes		0
6. Change due to assumption change		10,242,448
7. Expected UAL after all other changes $[(A4) + (A5) + (A6)]$		62,765,956
8. Actual UAL as of 6/30/14		45,537,832
9. Total (Gain)/Loss for 2013/2014 $[(A8) - (A7)]$	\$	(17,228,124)
B Contribution (Gain)/Loss for the Year		
7. Contribution (Gain)/Loss $[(B5) - (B6)]$	\$	(22,690)
C Asset (Gain)/Loss for the Year		
10. Asset (Gain)/Loss $[(C8) - (C9)]$	\$	(16,128,038)
D Liability (Gain)/Loss for the Year		
4. Liability (Gain)/Loss $[(D1) - (D2) - (D3)]$	\$	(1,077,396)

- Expected liability and asset values compared with actual values
- Explains changes to the UAL rate

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Non-Pooled Plans

- Why did my rate change? – Page 14

Schedule of Amortization Bases

Reason for Base	Date Established	Amortization Period	Balance 6/30/14	Expected Payment 2014-15	Balance 6/30/15	Expected Payment 2015-16	Amounts for Fiscal 2016-17		
							Balance 6/30/16	Scheduled Payment for 2016-17	Payment as Percentage of Payroll
ASSUMPTION CHANGE	06/30/03	9	\$6,535,457	\$755,928	\$6,241,854	\$776,606	\$5,902,717	\$801,964	3.149%
METHOD CHANGE	06/30/04	10	\$(581,038)	\$(62,827)	\$(559,475)	\$(64,712)	\$(534,341)	\$(66,653)	(0.262%)
BENEFIT CHANGE	06/30/06	12	\$817,505	\$78,767	\$797,150	\$81,130	\$772,819	\$83,554	0.328%
GOLDEN HANDSHAKE	06/30/09	15	\$147,781	\$12,415	\$145,993	\$12,788	\$143,683	\$13,171	0.052%
ASSUMPTION CHANGE	06/30/09	15	\$4,170,130	\$350,338	\$4,119,652	\$380,848	\$4,054,491	\$371,673	1.459%
SPECIAL (GAIN)/LOSS	06/30/09	25	\$4,017,054	\$254,594	\$4,054,364	\$262,232	\$4,086,554	\$270,099	1.060%
SPECIAL (GAIN)/LOSS	06/30/10	26	\$(2,751,874)	\$(171,112)	\$(2,780,851)	\$(176,245)	\$(2,806,680)	\$(181,533)	(0.713%)
ASSUMPTION CHANGE	06/30/11	17	\$5,035,466	\$392,902	\$5,005,757	\$404,689	\$4,961,598	\$416,830	1.636%
SPECIAL (GAIN)/LOSS	06/30/11	27	\$(2,464,441)	\$(150,513)	\$(2,493,218)	\$(155,029)	\$(2,519,472)	\$(159,680)	(0.627%)
PAYMENT (GAIN)/LOSS	06/30/12	28	\$1,776,794	\$106,697	\$1,799,428	\$109,898	\$1,820,440	\$113,195	0.444%
(GAIN)/LOSS	06/30/12	28	\$9,354,575	\$561,747	\$9,473,736	\$578,600	\$9,584,362	\$595,958	2.340%
(GAIN)/LOSS	06/30/13	29	\$25,466,096	\$(220,106)	\$28,879,264	\$403,375	\$30,411,981	\$820,952	3.262%
ASSUMPTION CHANGE	06/30/14	20	\$10,242,448	\$(75,528)	\$11,089,044	\$(77,897)	\$12,001,488	\$228,601	0.897%
(GAIN)/LOSS	06/30/14	30	\$(17,228,124)	\$88,231	\$(18,511,710)	\$95,580	\$(20,107,225)	\$(282,816)	(1.110%)
TOTAL			\$45,537,832	\$1,921,433	\$46,960,988	\$2,614,863	\$47,771,915	\$3,035,325	11.917%

- Bases comprising the plan's UAL
- 6/30/13 and later bases amortized according to new smoothing policy

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Non-Pooled Plans

- Why did my rate change? – Page 15

Alternate Amortization Schedules

Period	2016-17 Rate	Level Rate of Payroll Amortization			Difference from Current Schedule
		2016-17 Payment	Total Payments	Total Interest	
20	14.161%	\$3,607,039	\$96,922,488	\$49,150,573	\$3,405,074
15	17.193%	\$4,379,229	\$81,448,908	\$33,676,993	\$18,878,654

- Accelerate payments on the UAL
- Payoff sooner will save interest costs
- Compare 2016-17 rate to page 14 rate

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Non-Pooled Plans

- Where are my rates headed? – Page 20

Projected Rates

	Required Rate	Projected Future Employer Contribution Rates				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Contribution Rates:	21.133%	23.2%	25.2%	27.3%	27.7%	28.3%

- Assumes returns of 2.4% for 2014-5 and 7.5% thereafter
- Reflects new assumptions for 6/30/14 valuation
- Reflects new smoothing and amortization policy
- No demographic gains or losses after 6/30/14 included

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Non-Pooled Plans

- Where are my rates headed? – Page 21

Analysis of Future Investment Return Scenarios

2015-18 Investment Return Scenario	Estimated Employer Rate			Estimated Change in Employer Rate between 2017-18 and 2020-21
	2018-19	2019-20	2020-21	
(3.8%) (5th percentile)	26.5%	31.1%	35.1%	12.0%
2.8% (25th percentile)	25.8%	28.9%	30.9%	7.7%
7.5%	25.2%	27.3%	27.7%	4.5%
12.0%(75th percentile)	24.7%	25.6%	24.4%	1.2%
18.9%(95th percentile)	23.9%	23.1%	9.2%	(14.0%)

- Assumes returns of 2.4% for 2014-15 and varies thereafter
- No demographic gains or losses after 6/30/14 included
- Reflects new smoothing and amortization policy
- Reflects new assumptions change for 6/30/14
- Confidence interval for projected rates

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Non-Pooled Plans

- Where are my PEPRAs members?
 - Non pooled plans include PEPRAs members
 - Non pooled plans require the same **employer** rate for all members in the plan
 - Non pooled plans require differing **employee** rates
 - Classic member rate is set by statute
 - PEPRAs member rate can be found in Appendix D

DEVELOPMENT OF PEPRAs MEMBER CONTRIBUTION RATE

Rate Plan Identifier	Plan	Basis for Current Rate		Rates Effective July 1, 2016			
		Total Normal Cost	Member Rate	Total Normal Cost	Change	Change Needed	Member Rate
26274	Miscellaneous PEPRAs	13.300%	6.750%	13.209%	0.091%	No	6.750%

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Non-Pooled Plans

- What else? – Page 21

Analysis of Discount Rate Sensitivity

Sensitivity Analysis			
As of June 30, 2014	6.50% Discount Rate (-1%)	7.50% Discount Rate (assumed rate)	8.50% Discount Rate (+1%)
Total Normal Cost	20.190%	16.198%	13.169%
Accrued Liability	\$277,335,017	\$246,141,609	\$220,225,029
Unfunded Accrued Liability	\$76,731,240	\$45,537,832	\$19,621,252

- Highly sensitive to the discount rate
- CalPERS board will review the discount rate assumption again in February of 2017

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Non-Pooled Plans

- What else? – Page 22

Hypothetical Termination Liability

Valuation Date	Market Value of Assets (MVA)	Hypothetical Termination Liability ^{1,2} @ 2.00%	Unfunded Termination Liability @ 2.00%	Hypothetical Termination Liability ^{1,2} @ 3.75%	Unfunded Termination Liability @ 3.75%
06/30/14	\$ 200,603,777	\$ 485,274,863	\$ 284,671,086	\$ 378,482,754	\$ 177,878,977

- Highly sensitive to the discount rate

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Non-Pooled Plans

- What else? – Appendices
 - Appendix A
 - Assumptions and methods used in rate setting
 - Appendix B
 - Descriptions of all benefit provisions offered
 - Appendix C
 - Participant Data
 - Demographic information for the plan as of 6/30/14

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Non-Pooled Plans

- What else? – Appendices
 - Appendix D
 - PEPPRA Member Rate Information
 - Appendix E
 - Glossary of Actuarial Terms

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Pooled Plans

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Pooled Report – Common Questions

- What changes were made to risk pools?
- What is my rate?
- What is my UAL?
- Where is my rate headed?
- Where are my PEPRA members?
- What else should I be worried about?

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Pooled Plans

- What changes were made to risk pools?
 - All classic pools were combined into two pools
 - Miscellaneous
 - Safety
 - Plans are allocated a piece of the pool's UAL each year
 - Allocation is based on their share of the pool's liability

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Pooled Plans

- Why changes were made to risk pools?
 - To ensure proper funding of the pools
 - To make sure employers were paying their fair share of the costs
 - To help ease the unpredictable effect of shrinking payrolls caused by PEPRA

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Pooled Plans

- What changes were made to risk pools?
 - Annual rates are now billed as:
 - Normal cost percentage
 - UAL \$ amount
 - Plans within each risk pool have their own UAL
 - Employers now have the flexibility to pay off their UAL or accelerate payments towards it

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Pooled Plans

- What changes were made to risk pools?
 - Section 1 contains the bulk of information
 - Contribution rate
 - Unfunded liability
 - Plan specific projections
 - Section 2 has pool specific information

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Pooled Plans – Section 1

- What is my rate? - Cover page

Fiscal Year	Employer Normal Cost Rate	+	Employer Payment of Unfunded Liability
2016-17	10.069%		\$53,664
2017-18 (projected)	10.1%		\$60,726

- Rates do not reflect any cost sharing arrangements
- Fiscal Year 2017-18 projection reflects
 - 1st year impact of 2014-15 investment return 2.4%
 - Expiring side funds (if applicable)

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Pooled Plans – Section 1

- What is my rate? – Page 4

Required Employer Contribution

	Fiscal Year 2015-16 ¹	Fiscal Year 2016-17
Actuarially Determined Employer Contributions:		
Employer Contributions (in Projected Dollars)		
Plan's Employer Normal Cost	\$ 32,554	\$ 35,780
Plan's Payment on Amortization Bases	48,563	53,664 ²
Total Employer Contribution	\$ 81,117	\$ 89,444
Projected Payroll for the Contribution fiscal year	\$ 336,614	\$ 355,333
Required Employer Contributions (Percentage of Payroll)		
Pool's Base Employer Normal Cost	9.067%	9.498%
Surcharge for Class 1 Benefits ³		
a) FAC 1	0.604%	0.571%
Phase out of Normal Cost Difference ⁴	0.000%	0.000%
Pools Expected Employee Contribution for Formula	7.942%	7.944%
Plan's Total Normal Cost	17.613%	18.014%
Plan's Employee Contribution Rate	7.942%	7.944%
Employer Normal Cost Rate	9.671%	10.069%

Required Employer Contribution for Fiscal Year 2016-17	
Employer Normal Cost Rate ⁵	10.069%
Plus Monthly Employer Dollar UAL Payment⁶	\$ 4,472.01
Annual Lump Sum Prepayment Option	\$ 51,758

For Fiscal Year 2016-17 the total minimum required employer contribution is the sum of the Plan's Employer Normal Cost Rate (expressed as a percentage of payroll) plus the Employer Unfunded Accrued Liability (UAL) Contribution Amount (in dollars). Whereas in prior years it was possible to prepay total employer contributions for the fiscal year, beginning with Fiscal Year 2015-16 and beyond, only the UAL portion of the employer contribution can be prepaid. Late payments will accrue interest at an annual rate of 10 percent.

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Pooled Plans – Section 1

- Is my plan in good shape? – Page 5

Plan's Funded Status

	June 30, 2013	June 30, 2014
1. Present Value of Projected Benefits (PVB)	\$ 2,909,692	\$ 3,178,924
2. Entry Age Normal Accrued Liability	2,444,811	2,697,057
3. Plan's Market Value of Assets (MVA)	1,752,481	2,047,880
4. Unfunded Liability [(2) - (3)]	692,330	649,177
5. Funded Ratio [(3) / (2)]	71.7%	75.9%

- Unfunded Liability = UAL = Unfunded Accrued Liability
- Funded Ratio is one indicator of the plan's health
- Information as of June 30, 2014

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Pooled Plans – Section 1

- What is my UAL? – Page 8

Schedule of Plan's Side Fund and Other Amortization Bases

Reason for Base	Date Established	Amortization Period	Balance 6/30/14	Payment 2014-15	Balance 6/30/15	Payment 2015-16	Amounts for Fiscal 2016-17	
							Balance 6/30/16	Scheduled Payment for 2016-17
SIDE FUND	2013 or Prior	\$	\$135,374	\$20,280	\$124,500	\$20,888	\$112,180	\$21,515
ASSET (GAIN)/LOSS	06/30/13	29	\$248,233	\$0	\$266,850	\$3,753	\$282,973	\$7,732
SHARE OF PRE-2013 POOL UAL	06/30/13	20	\$325,425	\$21,887	\$327,139	\$23,959	\$326,833	\$24,678
NON-ASSET (GAIN)/LOSS	06/30/13	29	\$(2,434)	\$0	\$(2,617)	\$(37)	\$(2,775)	\$(76)
ASSET (GAIN)/LOSS	06/30/14	30	\$(176,153)	\$0	\$(189,364)	\$0	\$(203,566)	\$(2,863)
NON-ASSET (GAIN)/LOSS	06/30/14	30	\$210	\$0	\$226	\$0	\$243	\$3
ASSUMPTION CHANGE	06/30/14	20	\$118,521	\$(1,599)	\$129,068	\$(1,647)	\$140,456	\$2,675
TOTAL			\$649,176	\$40,568	\$655,802	\$46,916	\$656,344	\$53,664

- Side Fund has been incorporated
- Share of pre-2013 Pool UAL is the allocation of the pool's UAL
- Employers can now pay off any portion of the UAL

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Pooled Plans – Section 1

- What is my UAL? – Page 9

Alternate Amortization Schedules

Period	2016-17 Payment	Level Rate		Savings
		Total Payments	Total Interest	
15	\$60,167	\$1,119,036	\$462,692	\$141,172
10	\$81,872	\$938,571	\$282,227	\$321,637

- Accelerate payments on the UAL
- Payoff sooner will save interest costs
- Compare 2016 -17 payment to page 8 payment

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Pooled Plans – Section 1

- Where is my rate headed? – Page 5

Projected Employer Contributions

	Required Contribution	Projected Future Employer Contribution Rates				
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Normal Cost %	10.069%	10.1%	10.1%	10.1%	10.1%	10.1%
UAL \$	\$53,664	\$60,726	\$68,164	\$75,994	\$79,923	\$84,234

- Assumes return of 2.4% for 2014-15 and 7.5% thereafter
- Reflects new assumptions for 6/30/14 valuation
- Reflects new smoothing and amortization policy
- No demographic gains or losses after 6/30/14 included

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Pooled Plans – Section 1

- Where is my rate headed? – Page 13

Analysis of Future Investment Return Scenarios

2015-18 Investment Return Scenario	Estimated Employer UAL Contribution			Estimated Total Change in Employer UAL Contribution between 2017-18 and 2020-21
	2018-19	2019-20	2020-21	
(3.8%) (5th percentile)	\$72,012	\$87,607	\$103,304	\$42,578
2.8% (25th percentile)	\$69,765	\$80,930	\$90,076	\$29,350
7.5%	\$68,164	\$75,994	\$79,923	\$19,197
12.0%(75th percentile)	\$66,632	\$71,126	\$69,610	\$8,884
18.9%(95th percentile)	\$64,281	\$63,395	\$0	\$(60,726)

- Assumes returns of 2.4% for 2014-15 and varies thereafter
- No demographic gains or losses after 6/30/14 included
- Reflects new smoothing and amortization policy
- Reflects new assumptions change for 6/30/14
- Confidence interval for projected rates

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Pooled Plans – Section 1

- Where are my PEPRA members?
 - With pooled plan, classic and PEPRA rates are completely separate
 - Pooled plans require different **employer** rates for Classic and PEPRA members
 - Pooled plans also require different **employee** rates
 - Normal cost rate for the group is on page 4

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Pooled Plans – Section 1

- What else? – Page 14

Analysis of Discount Rate Sensitivity

Sensitivity Analysis			
As of June 30, 2014	6.50% Discount Rate (-1%)	7.50% Discount Rate (assumed rate)	8.50% Discount Rate (+1%)
Plan's Total Normal Cost	22.3%	18.0%	14.7%
Accrued Liability	\$3,006,546	\$2,697,057	\$2,436,369
Unfunded Accrued Liability	\$958,666	\$649,177	\$388,489

- Highly sensitive to the discount rate
- CalPERS board will review the discount rate assumption again in February of 2017

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Pooled Plans – Section 1

- What else? – Page 15

Hypothetical Termination Liability

Valuation Date	Market Value of Assets (MVA)	Hypothetical Termination Liability ^{1,2} @ 2.00%	Unfunded Termination Liability @ 2.00%	Hypothetical Termination Liability ^{1,2} @ 3.75%	Unfunded Termination Liability @ 3.75%
06/30/14	\$ 2,047,880	\$ 4,820,193	\$ 2,772,312	\$ 3,918,087	\$ 1,870,207

- Highly sensitive to the discount rate

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Pooled Plans – Section 2

- Now available on CalPERS online
 - See Section 1 for web address
- Has pool specific information

Section 2

CALIFORNIA PUBLIC EMPLOYEES' RETIREMENT SYSTEM

**Section 2 may be found on the CalPERS website
(www.calpers.ca.gov) in the Forms and
Publications section**

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Pooled Plans – Section 2

- Appendices
 - Appendix A Actuarial Methods and Assumptions
 - Appendix B Principal Plan Provision
 - Appendix C Optional Benefit Information
 - Appendix D New Amortization Bases FY 2013-14
 - Appendix E Participant Data
 - Appendix F Glossary

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Questions & Discussion

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