



## **Workers' compensation: what about frequency?**

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# Agenda

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- ▶ Trend considerations
- ▶ Exposure
- ▶ Severity
- ▶ Example – Frequency consideration
- ▶ Industry resources
- ▶ Economy
- ▶ Future
- ▶ Health care reform – black lung

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# Trend considerations

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- ▶ Exposure
- ▶ Severity
- ▶ Frequency

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# Exposure

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- ▶ Definition of exposure:  
“A unit of measure, which represents the extent of risk.”
  
- ▶ Factors affecting exposure base selection:
  1. Correlates with loss
  2. Ease of determination
  3. Responsiveness to change

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# Exposure units

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- ▶ No inherent trend
- ▶ Wage-level trend
- ▶ Wage level and rate
- ▶ Other indices

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## Exposure units – no inherent trend

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- ▶ Staff-hours
- ▶ Full-time equivalents
- ▶ Head count

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## Exposure units – wage-level trend

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- ▶ Payroll
- ▶ Considerations:
  - ▶ Classification mix
  - ▶ Limited versus unlimited



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## Exposure units – wage level and rate

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- ▶ Premium
- ▶ Considerations:
  - ▶ Pricing

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## Exposure units – other indices

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- ▶ Sales
- ▶ Lost-time injuries

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# Loss

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- ▶ Frequency – number of claims per exposure
- ▶ Severity – average cost per claim

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# Severity

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- ▶ Ways to segregate:
  - ▶ Indemnity, medical, expense
  - ▶ Injury type:
    - ▶ Fatal
    - ▶ PTD
    - ▶ PPD
    - ▶ TTD
    - ▶ Med only

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## Severity – indemnity, medical and expense drivers

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- ▶ Indemnity:
  - ▶ Wage
  - ▶ Reforms
- ▶ Medical:
  - ▶ Underlying medical inflation
  - ▶ Reforms
- ▶ Expense:
  - ▶ Attorney fees
  - ▶ Reforms
  - ▶ Other lines of business (attorney concentration)
- ▶ Medical/indemnity split approximately 60/40
  - ▶ (Conning – May 2010)

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# Audit support example

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- ▶ Guidance for actuarial support:
  - ▶ Methods and assumptions
  - ▶ Independent analysis
  - ▶ Both

# Client analysis – determination of pure premium – no frequency considered

Accident year	Selected ultimate loss	Loss trend factor	Trended ultimate loss	Payroll	Payroll trend factor	Trended payroll	Pure premium
1998	1,022	1.716	1,754	43.5	1.345	58.5	30.0
1999	1,241	1.637	2,031	53.7	1.312	70.5	28.8
2000	1,045	1.579	1,651	45.7	1.280	58.5	28.2
2001	1,080	1.503	1,623	50.1	1.249	62.5	26.0
2002	1,090	1.441	1,571	48.7	1.218	59.3	26.5
2003	1,107	1.387	1,536	50.3	1.189	59.8	25.7
2004	1,101	1.314	1,447	51.7	1.160	59.9	24.1
2005	1,148	1.253	1,438	53.2	1.131	60.1	23.9
2006	1,307	1.198	1,566	63.8	1.104	70.4	22.2
<b>All year weighted</b>							<b>26.1</b>

**Notes:**

Loss trend based on industry.

Payroll trend based on wage assumption of 2.5%.

## Client analysis – ultimates – no frequency considered

Accident year	Selected PP	Payroll	A-priori ultimate	Incurred to date	Incurred LDF	Incurred ultimate	BF ultimate	Ratio
2007	24.6	67.8	1,666	950	1.374	1,305	1,404	1.08
2008	25.1	62.7	1,571	760	1.678	1,275	1,395	1.09
2009	25.6	63.2	1,616	210	5.499	1,155	1,532	1.33
<b>Total</b>		<b>193.7</b>	<b>4,853</b>	<b>1,920</b>		<b>3,735</b>	<b>4,331</b>	<b>1.16</b>

**Note:**

Selected PP detrended based on loss and payroll trends.



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# Frequency

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- ▶ Drivers:
  - ▶ Safety and loss control
  - ▶ Legislation
  - ▶ Economic conditions
  - ▶ Class of business

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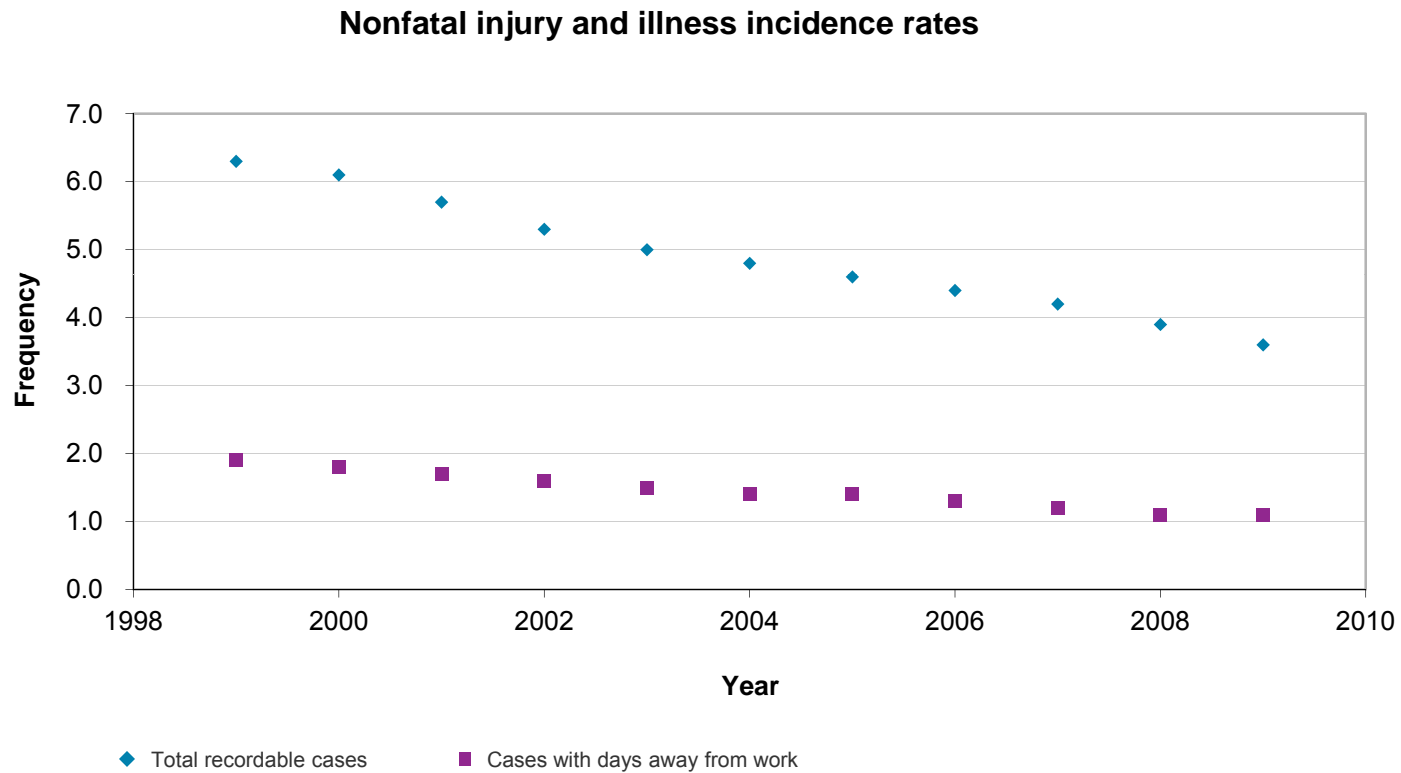
# Frequency trend

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- ▶ Loss time injuries per 100 workers
  
- ▶ Total recordable cases:
  - ▶ 1999: 6.3
  - ▶ 2009: 3.6
  - Average annual change: -5.4%
  
- ▶ Total cases with days away from work:
  - ▶ 1999: 1.9
  - ▶ 2009: 1.1
  - Average annual change: -5.3%

Source: Bureau of Labor Statistics, 2010 ([www.bls.gov](http://www.bls.gov)).

# Frequency trend – Bureau of Labor Statistics (BLS)



Source: Bureau of Labor Statistics, "Table 1: Incidence rate of nonfatal occupational injuries and illnesses by industry and case types," [www.bls.gov/iif/oshsum](http://www.bls.gov/iif/oshsum).

# Client-modified – frequency trend – industry LDF

Accident year	Claim count	Claim count LDF	Claim count ultimate	Trended payroll	Frequency	Fitted frequency	
1998	136	1.000	136	58.5	2.33	2.10	
1999	136	1.000	136	70.5	1.93	2.04	
2000	106	1.001	106	58.5	1.82	1.99	
2001	95	1.006	96	62.5	1.53	1.93	
2002	128	1.012	130	59.3	2.18	1.88	
2003	120	1.020	122	59.8	2.05	1.82	
2004	110	1.028	113	59.9	1.89	1.77	
2005	91	1.038	94	60.1	1.57	1.71	
2006	110	1.056	116	70.4	1.65	1.66	
2007	104	1.087	113	73.0	1.55	1.60	
2008	86	1.189	102	65.9	1.55	1.54	
<b>Total</b>	<b>1,222</b>		<b>1,264</b>	<b>698.4</b>			
						<b>Selected frequency trend</b>	<b>-3.0%</b>

**Notes:**

Claim count LDF from industry source.  
Fitted based on trend function in Excel.

# Independent analysis – frequency trend – company history

Accident year	Claim count	Claim count LDF	Claim count ultimate	Trended payroll	Frequency	Fitted frequency	
1998	136	1.000	136	58.5	2.33	2.13	
1999	136	1.000	136	70.5	1.93	2.06	
2000	106	1.000	106	58.5	1.81	1.99	
2001	95	1.000	95	62.5	1.52	1.91	
2002	128	1.000	128	59.3	2.16	1.84	
2003	120	1.000	120	59.8	2.01	1.77	
2004	110	1.000	110	59.9	1.84	1.69	
2005	91	1.000	91	60.1	1.51	1.62	
2006	110	1.003	110	70.4	1.57	1.55	
2007	104	1.003	104	73.0	1.43	1.47	
2008	86	1.020	88	65.9	1.33	1.40	
<b>Total</b>	<b>1,222</b>		<b>1,224</b>	<b>698.4</b>			
						<b>Selected frequency trend</b>	<b>-4.1%</b>

**Notes:**

Claim count LDF from company history. (2008 is age 20 mo.)  
 Fitted based on trend function in Excel.

# Independent analysis – determination of pure premium – frequency considered

Accident year	Selected ultimate loss	Severity trend factor	Frequency trend factor	Total trend factor	Trended ultimate loss	Trended payroll	Pure premium
1998	1,022	1.716	0.604	1.036	1,059	58.5	18.1
1999	1,241	1.637	0.630	1.031	1,279	70.5	18.1
2000	1,045	1.579	0.657	1.037	1,084	58.5	18.5
2001	1,080	1.503	0.685	1.029	1,112	62.5	17.8
2002	1,090	1.441	0.714	1.029	1,122	59.3	18.9
2003	1,107	1.387	0.745	1.033	1,144	59.8	19.1
2004	1,101	1.314	0.777	1.021	1,124	59.9	18.8
2005	1,148	1.253	0.810	1.015	1,165	60.1	19.4
2006	1,307	1.198	0.845	1.013	1,324	70.4	18.8
<b>All year weighted</b>							<b>18.6</b>

**Notes:**

Severity trend based on industry source.

Payroll trend base on wage assumption of 2.5%.

# Independent analysis – ultimates – frequency considered

Accident year	Selected PP	Payroll	A-priori ultimate	Incurred to date	Incurred LDF	Incurred ultimate	BF ultimate	Ratio
2007	19.9	67.8	1,347	950	1.374	1,305	1,317	1.01
2008	19.4	62.7	1,218	760	1.678	1,275	1,252	0.98
2009	19.0	63.2	1,201	210	5.499	1,155	1,193	1.03
<b>Total</b>		<b>193.7</b>	<b>3,766</b>	<b>1,920</b>		<b>3,735</b>	<b>3,762</b>	<b>1.01</b>

**Note:**

Selected PP detrended based on loss and payroll trends.

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## Considerations when choosing frequency trend

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- ▶ Company's own historical data:
  - ▶ Use indemnity claims
- ▶ Industry claim count LDFs – what is included?
- ▶ States the company operates in:
  - ▶ Has there been legislation?
- ▶ Business of the company:
  - ▶ BLS has frequency for various classes.
- ▶ Economy



## Client example – BLS class frequency

- ▶ Consider the class information for the company
- ▶ Primary metal manufacturing example

Primary metal manufacturing industry		
Year	Injuries per 100 full-time workers	Percent change from prior year
2009	5.6	-16.4%
2008	6.7	-10.7%
2007	7.5	-3.8%
2006	7.8	-6.0%
2005	8.3	-8.8%
2004	9.1	

# BLS tables

Industry Injury and Illness Data - Windows Internet Explorer provided by Ernst & Young

http://www.bls.gov/iif/oshsum.htm

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PUBLISHED ARTICLES

FACT SHEETS

SPECIAL RELEASES

## Industry Injury and Illness Data - 2009

- **Summary News Release**
  - Text and tables - 2009 ([HTML](#)) ([PDF](#))
- **Supplemental News Release Tables**
  - SNR01. Highest rates for total cases - Injuries and Illnesses - 2009 ([TXT](#)) ([PDF](#))
  - SNR02. Highest rates for cases with days away from work, restricted work activity, or job transfer (DART) - Injuries and Illnesses - 2009 ([TXT](#)) ([PDF](#))
  - SNR03. Highest rates for cases with days away from work - Injuries and illnesses - 2009 ([TXT](#)) ([PDF](#))
  - SNR04. Highest rates for cases with days of job transfer or restriction - Injuries and Illnesses - 2009 ([TXT](#)) ([PDF](#))
  - SNR05. Injury cases - rates, counts, and percent relative standard errors - detailed industry - 2009 ([TXT](#)) ([PDF](#))
  - SNR06. Highest rates for total injury cases - 2009 ([TXT](#)) ([PDF](#))
  - SNR07. Illness cases by category of illness - rates, counts, and percent - industry division - 2009 ([TXT](#)) ([PDF](#))
  - SNR08. Illness rates by category of illness - detailed industry - 2009 ([TXT](#)) ([PDF](#))
  - SNR09. Percent relative standard errors of illness rates by category of illness - detailed industry - 2009 ([TXT](#)) ([PDF](#))
  - SNR10. Number of illnesses by category of illness - detailed industry - 2009 ([TXT](#)) ([PDF](#))
  - SNR11. Percent relative standard errors of illness counts by category of illness - detailed industry - 2009 ([TXT](#)) ([PDF](#))
  - SNR12. Highest rates for total illness cases - 2009 ([TXT](#)) ([PDF](#))
  - Charts presenting the 2009 survey results ([PDF](#)) ([HTML](#))

Source: www.bls.gov/iif/oshsum.htm

# BLS Table SNR05

http://www.bls.gov/iif/oshwc/osh/os/ostb2427.pdf - Windows Internet Explorer provided by Ernst & Young

http://www.bls.gov/iif/oshwc/osh/os/ostb2427.pdf

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Sterling, Ian P - Outlook Web... http://www.bls.gov/iif/os...

11 / 32 100% primary metal

**TABLE SNR05. Incidence rate<sup>1</sup> and number of nonfatal occupational injuries by industry and ownership, 2009 — Continued**

Industry <sup>2</sup>	NAICS code <sup>3</sup>	2009 Annual average employment <sup>4</sup> (thousands)	Incidence rate	Number of cases (thousands)	Percent relative standard errors	
					Incidence rate	Number of cases
Glass container manufacturing .....	327213	16.5	4.8	0.8	9	9
Glass product manufacturing made of purchased glass .....	327215	43.0	3.7	1.6	32	29
Cement and concrete product manufacturing .....	3273	206.2	5.2	10.1	6	5
Ready-mix concrete manufacturing .....	32732	101.2	5.3	4.9	9	9
Concrete pipe, brick, and block manufacturing .....	32733	31.6	5.9	1.8	12	11
Concrete block and brick manufacturing .....	327331	21.4	6.0	1.3	14	13
Concrete pipe manufacturing .....	327332	10.2	5.6	6	19	18
Other concrete product manufacturing .....	32739	56.2	5.4	3.0	8	8
Lime and gypsum product manufacturing .....	3274	16.1	2.5	4	24	22
Gypsum product manufacturing .....	32742	11.8	1.8	2	15	17
Other nonmetallic mineral product manufacturing .....	3279	72.4	5.4	3.8	11	10
Abrasive product manufacturing .....	32791	10.0	4.5	4	24	24
All other nonmetallic mineral product manufacturing .....	32799	62.3	5.5	3.4	11	11
Cut stone and stone product manufacturing .....	327991	26.9	7.6	2.0	18	18
Ground or treated mineral and earth manufacturing .....	327992	5.9	3.0	2	12	12
Mineral wool manufacturing .....	327993	17.3	4.1	7	15	16
All other miscellaneous nonmetallic mineral product manufacturing .....	327999	12.3	4.5	5	19	20
Primary metal manufacturing .....	331	404.9	5.6	21.9	3	2
Iron and steel mills and ferroalloy manufacturing .....	3311	92.2	3.1	2.9	7	7
Iron and steel mills and ferroalloy manufacturing .....	33111	92.2	3.1	2.9	7	7
Iron and steel mills .....	331111	89.3	3.1	2.8	7	7
Steel product manufacturing from purchased steel .....	3312	56.9	6.9	3.7	7	6
Iron and steel pipe and tube manufacturing from purchased steel .....	33121	25.8	8.3	2.0	10	9
Rolling and drawing of purchased steel .....	33122	21.1	5.7	1.7	0	10

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Source: www.bls.gov/iif/oshsum.htm

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## Economic effects – frequency

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- ▶ Recession – schools of thought:
  - ▶ Increase – workers' compensation may be seen as preferable to unemployment benefits
  - ▶ Decrease – workforce shifts to more seasoned workers, who have fewer injuries due to on-the-job experience

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## Economic effects – severity

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- ▶ Extended duration:
  - ▶ Failure of return-to-work programs
- ▶ Re-openings:
  - ▶ Injuries from prior periods “flare up”

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# Future

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- ▶ Frequency:
  - ▶ Expected to bottom and increase with a recovery
- ▶ Severity:
  - ▶ Continue to rise
- ▶ Legislation
- ▶ Judicial decisions

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# Resources

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- ▶ Masterson
- ▶ US DOL/BLS
- ▶ Consumer Price Index
- ▶ Insurance Information Institute
- ▶ Workers' Compensation Research Institute
- ▶ National Council on Compensation Insurance (Stat Bulletin)
- ▶ Independent rating organizations
- ▶ Commercial publications:
  - ▶ Conning
  - ▶ *Workers' Compensation Reporter* (LRP publication)
  - ▶ Law firms
- ▶ Others

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## Health care reform – black lung

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- ▶ Section 1556, Equity for Certain Eligible Survivors:
  - ▶ (a) Rebuttable presumption:
    - ▶ Miner with 15 years of service who contracted a lung disease, contracted it on the job
  - ▶ (b) Continuation of benefits:
    - ▶ Upon death, continuation of benefits for survivors will be automatic
  - ▶ (c) Effective date:
    - ▶ Claims filed after January 1, 2005, that were pending on or after the date of enactment of this Act (March 23, 2010)



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## Health care reform – US Department of Labor (DOL) comment

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- ▶ “Out of approximately 4,600 (pending) claims, only 37 involved the fact pattern where the miner had proved 15 or more years of covered coal mine employment and a totally disabling respiratory impairment and were currently in a denied status.”

# Health care reform – totally disabled denials

Years	Denied*	Approved	Percent increase
Post-1983	1,637	42,877	3.8%
Post-2005	388	9,366	4.1%

\* Denied from 107, 110, 150, 157  
From US DOL 9/30/10

These four denial codes represent claims that could potentially be approved due to Health Care Reform Act, as they were proven totally disabled. These claims are for miners with more than 15 years of coal mine employment (CME).

107	Presence of CWP not proven; total disability proven in accord with Act and Regulations.
110	Presence of CWP proven in fact or by presumption; totally disabled according to Act; causality of CWP to CME not proven.
150	Presence of CWP proven in fact or by presumption; totally disabled according to Act; causality of CWP to CME not proven. Denied in accordance with Part 718 (claims filed on or after March 31, 1980).
157	Presence of CWP not proven; total disability proven in accord with Act. Denied in accordance with Part 718 (claims filed on or after March 31, 1980).

# Health care reform – what’s happened

Number of approvals as of 6/30/11, which were denied with total disability and 15+ years of CME as of 3/31/10

Years	Denied*	Since approved
Post-1983	1,637	28
Post-2005	388	18

\* Denied from 107, 110, 150, 157  
From US DOL 6/30/11

Number of denied claims with total disability and 15+ years of CME from 3/31/10

Newly denied*		
Years	Ruling as of 3/31/10	No ruling as of 3/31/10
Post-1983	22	43
Post-2005	16	43

\* Denied from 107, 110, 150, 157  
From US DOL 6/30/11